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Westinghouse Astronuclear Laboratory

OPERATIONAL MANUAL AND ACCEPTANCE TEST PROCEDURES FOR ETS-1 10 CHANNEL AVERAGERS

MODEL 936J154G01 (ECS)
MODEL 936J154G02 (TSCS)

DISCLAIMER

Astronuclear Laboratory

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TITLE: Operational Manual and Acceptance Test Procedures for ETS-1 10 Channel Averagers. Model 936J154G01 (ECS) Model 936J154G02 (TSCS)

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ETS-1 10 CHANNEL AVERAGER CHASSIS OPERATIONAL MANUAL

1.0 INTRODUCTION

This operational manual contains the general description, theories of operation, alignment procedures, maintenance and repair data, and schematic diagrams for the WANL ETS-1 10 Channel Averagers Chassis for the Instrumentation system.

1.1 General Description

The WANL ETS-1 10 Channel Averagers are composed of two chassis. One chassis, 936J154G01, is for the Engine Control System and contains two 10 channel circuits. The other chassis, 936J154G02, is for the Test Stand Control System and contains three 6-channel and two 4-channel circuits. Since all circuitry for the 10 channel, 6 channel, and 4 channel is similar, only the description of the 10 channel circuits will be described in this manual.

The 10 Channel Averagers Chassis are rack mounted, wholly self-contained, all solid state electronic averaging and rejection circuit. They are made up of card rack assemblies mounted in chassis drawers. Each instrument electronically averages the input signals, automatically rejects any input outside of an adjustable "reject" band from this average and provides an output signal equal to the average of the inputs not rejected. This average signal and original input signals are compared in the automatic rejection circuits which eliminate high and low signal channels up to a manual preset limit of six.

The instruments have provision for manually rejecting inputs by manually inserting shorting pins in a patchboard of SPST normally open switches. Redundancy in the averaging system insures that a single instrument failure will not result in loss of the output average signal.

2.0 GENERAL DATA

2.1 Safety Precautions

None other than standard, good-practice safety precautions need to be observed. No high voltages, other than +28 VDC and ±15 VDC from the external primary power source, are present in the units. The maximal voltage is 30 volts DC. If it should become necessary to perform corrective maintenance, component removal, or service, prudence dictates that the units should be disconnected from the primary power source by disengaging the multi-pin power connectors, J1, on each unit or by performing such activity during system down-time.

2.2 Weight and Dimensions

The WANL ETS-1 10 Channel Averager Chassis have the following gross physical characteristics:

Weight	lbs.
Dimensions	19" wide 21" deep 7" high

2.3 Power Requirements

Primary power for the WANL ETS-1 10 Channel Averager Circuit is plus and minus 15 VDC and plus 28 VDC. This power is obtained from a source external to the unit and enters the units, along with other circuits, via a multipin 16 connector, J1.

2.4 Heat Dissipation

All components have been selected to the end that special subsystem heating, cooling, or ventilation is not necessary. Adequate separation of modules and printed circuit assemblies provide satisfactory up-draft.

2.5 Salient Design Characteristics

The 10 Channel Averager Chassis mounts all solid state components, with

minimal use of moving parts, variable controls, adjustments, and switches consistent with optimal performance. While designed to good commercial practices this equipment embodies the high standards required by military specifications. All components are unusually rugged, sturdily built, and held to close tolerances without overload. Long term (40,000 hours), trouble free operation is assured throughout the non-obsolescent life of the equipment.

3.0 10 CHANNEL AVERAGER CHASSIS DETAILED DESCRIPTION

3.1 The 10 Channel Averager Chassis contains printed card modular circuitry in the following major services: Averaging Amplifier circuits, Auctioneer Circuits, Complementary Circuits, Auto-manual Reject Circuits, and Buffers. Westinghouse Drawing 936J154 shows the locations of these major modules. Figures 1 and 2 show photographs of the top view and front view of the TSCS 10 Channel Averager.

3.2 Resistors

Resistors are a military standard (1% RN); wire wound where necessary.

3.3 Capacitors

Capacitors are of military standards or superior.

3.4 Transistors and Diodes

All transistors and diodes are military standard or superior, and are silicon.

3.5 Operational Amplifiers

All operational amplifiers are of the highest grade, purchased to the maximum in reliability testing and performance.

3.6 Chassis

Aluminum alloy - sheet stock, bolt and rivet construction. Card slots are plastic.

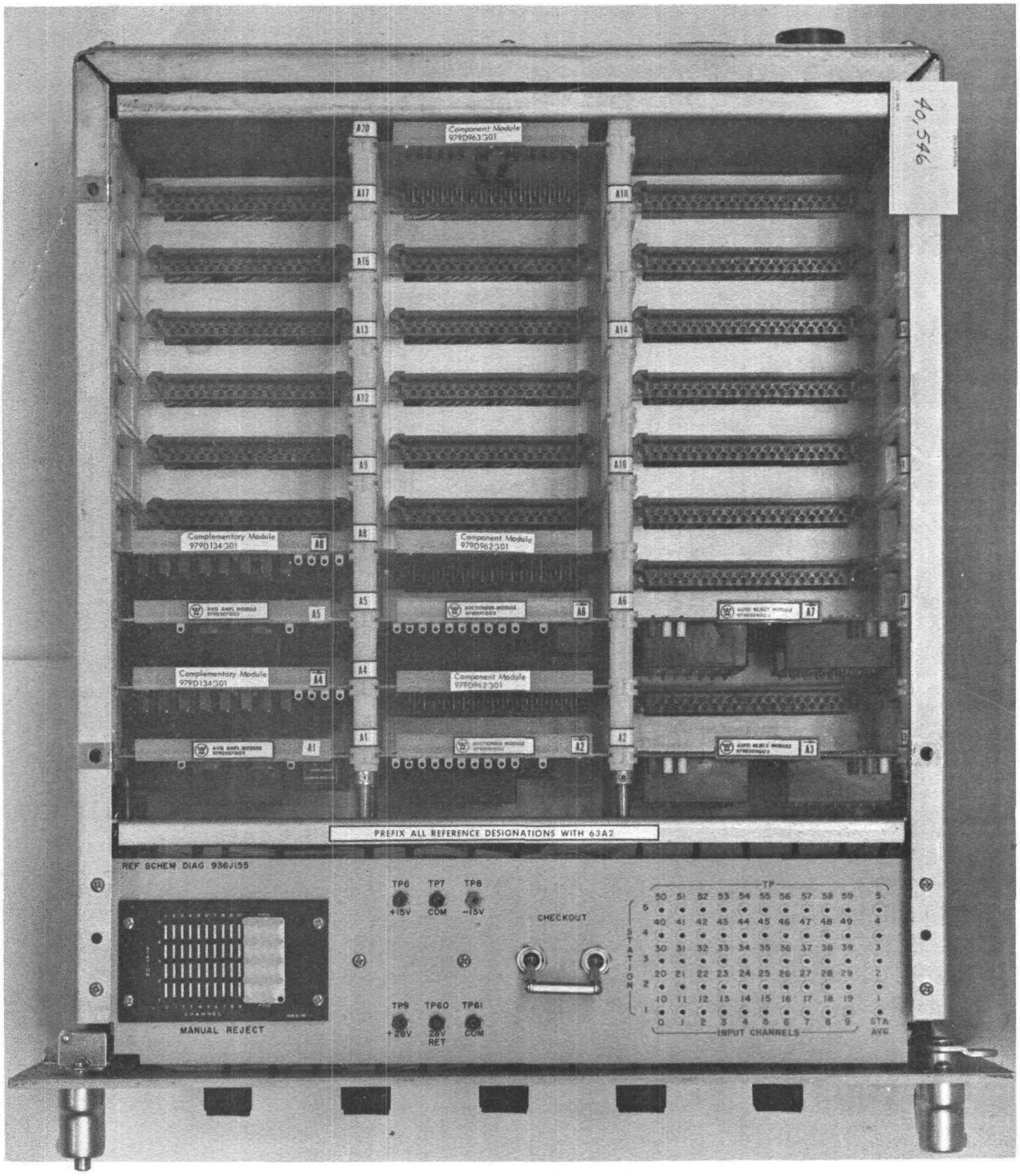


Figure 1 Top View - 10 Channel Averager (TSCS)

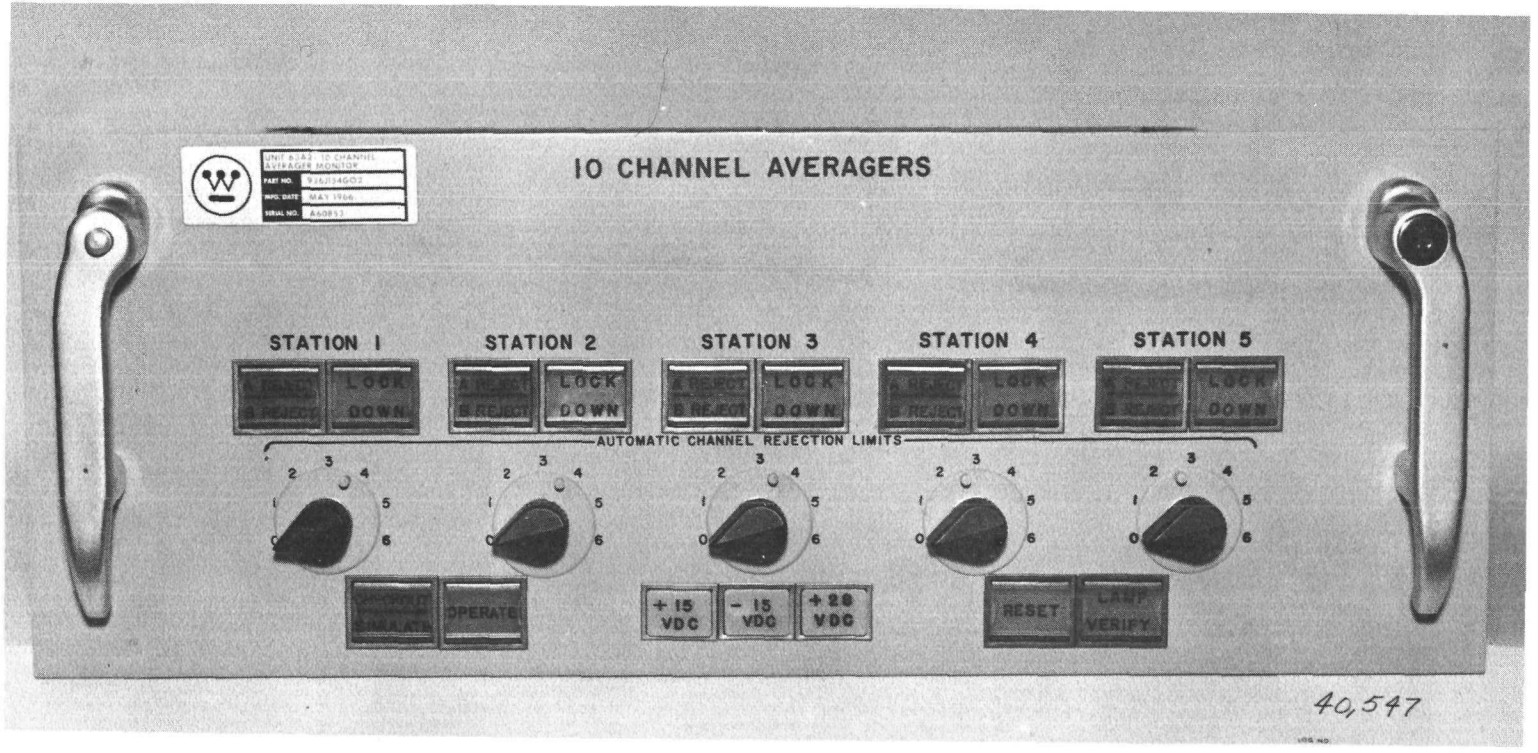


Figure 2 Front View - 10 Channel Averager (TSCS)

4.0 INSTALLATION INSTRUCTIONS

4.1 10 Channel Averagers Chassis

The following procedure should be used for the proper installation. Mount the removable part of the chassis guides at the desired selected level in a standard 19-inch rack. WANL Drawing 936J154 gives the mounting dimensions, plan view, and construction details of the chassis, panel, and connectors.

Refer also to Westinghouse Astronuclear Drawing 936J159 (Wiring Diagram). This drawing shows, in addition to the internal wiring, the external service connections that are to be made to the units, via the connectors at the rear of the chassis.

5.0 PRINCIPLES OF OPERATION

The 10 Channel Averager circuitry averages the input signals, establishes a reject band around this average (this reject band is adjustable within the equipment), rejects any one channel that is outside this band, and provides an output signal equal to the average of the inputs not rejected.

Two averaging amplifiers are redundant upon each other and their outputs are auctioneered. Circuitry in the 10 channel averager chassis senses when an averager is malfunctioning high and rejects this average amplifier, however, only one of the two average amplifiers will be rejected by this circuitry.

The average signal is applied to additional automatic reject circuitry in the chassis which generates an output signal that rejects any temperature channel which is outside a preset ± 1 volt band. Rejections of channels are limited to six in the ten channel circuitry by presetting manual switches on the front panel.

The four major functional circuits in the chassis are as follows: the averaging circuits, the auctioneer circuits, the automatic and manual rejection circuits, and the complementary circuits. The operation of each of these functional circuits are described individually in the following sections.

5.1 Auto-Reject Circuitry

The auto-reject circuitry (Schematics 936J155, 909E596, and 909E592) has ten signal inputs, S_0 through S_9, which come from signal conditioning equipment fed by thermocouples on the engine. In addition, an average signal, $S_{avg.}$, electronically developed by the averaging amplifiers serves as a second input to all the auto-reject circuitry. A third lockdown signal overrides the above two signals for each auto-reject module when preset rejection limits, controlled by the manual reject limit switch in the Lockdown circuit, are exceeded (limit is 6 rejects for 10 channel averager circuitry).

When average input, $S_{avg.}$, to pin 6 (Schematic 909E692) and signal input, S_0, to pin 10 are within the ± 1 volt rejection band (for example $S_{avg.} = +8$ volt, S_0 can vary between -7 volt and -9 volt before it is rejected), the following circuit non-reject conditions exist: Q_1, Q_2, Q_6, Q_7, and Q_8 are non-conducting and Q_3, Q_4, and Q_5 are conducting. The circuit at the top of Drawing 909E592 comprises the low signal setpoint circuit and the bottom circuit comprises the high signal setpoint circuit. The top circuit is set so that Q_7 and Q_8 start conducting when signal input, S_0, falls one volt below signal average, $S_{avg.}$ ($S_0 = -7$ VDC, $S_{avg.} = +8$ VDC). When this occurs Q_1 and Q_2 start conducting. The base voltage on Q_3 drops causing Q_3 to switch to the non-conducting state. The collector voltage of Q_3 rises causing current to flow through CR2, and voltage divider R_{26} and R_{27}. The voltage across R_{27} is sufficient to cause Q_7 and Q_8 to conduct. The output at pin 14 changes from approximately -10 VDC to +11.3 VDC. This positive reject voltage, R_0, is coupled to the averaging amplifier circuit, the auctioneer circuit, and the lockdown circuit. Therefore, signal input, S_0, is now eliminated from contributing to the average signal output of the averager or the high signal select signal in the auctioneer module. It also reduces by one the number of rejects remaining before lockdown occurs in the lockdown circuit.

The following circuit action occurs when the signal input, S_0, increases one volt above the signal average, $S_{avg.}$. Normally when the average signal, $S_{avg.}$, and the

channel 0 input signal, S_0, are +8 volt and -8 volt, respectively, and the auto-reject circuit is not in the reject mode, Q_4 and Q_5 are conducting and Q_6, Q_7, and Q_8 are non-conducting If input signal, S_0, increases to the point where S_0 is one volt more negative (S_0 = -9 volt $S_{avg.}$ = +8 volt), Q_4 and Q_5 stop conducting, and Q_6 conducts. The collector voltage of Q_5 increases causing a current to flow through voltage divider R_{26} and R_{27}. This voltage across R_{27} is sufficient to cause Q_7 and Q_8 to conduct. The output from Pin 14 changes from approximately -10.0 VDC to +11.3 VDC. This reject voltage output, R_0, eliminates channel 0 input signal S_0 from contributing to the average signal, $S_{avg.}$, originating in the averaging amplifiers. These signals are called reject signals and are identified as R_0 through R_9.

The normal voltage at Pin 3 and 18 when lockdown is not in effect are < -7.5 V and > +7.5 V, respectively. These voltages have no effect on the operation of the auto-reject circuit when polarity is as stated above, because both diodes CR3 and CR1 are reversed biased, and therefore are non-conducting. When lockdown is in effect the voltages are reversed, both CR3 and CR1 are now forward biased and conducting causing their respective summing points to be unaffected by signal input, S_0, and signal average, $S_{avg.}$. Therefore, the auto-rejection circuits are now ineffective in rejecting any more channels which exceed the ± 1 volt reject limit due to these lockdown voltages.

If an auto-reject module is rejected due to a line transient or a switching perturbation it can be reset by throwing the reset switch on the front of the panel. This actuates the one-shot module which applies a +15 V potential to Pin 7, which causes Q_7 and Q_8 to return to the non-conducting state. This returns the auto-reject module to the normal operating mode.

Manual rejection of signal channels can be initiated by inserting shorting pins in the shorting switches mounted in a patchboard on the test panel. This produces the same rejection voltages (+11.3 volts) R_0 through R_9, as the auto-reject circuit previously described supplies. The rejection limit of six signals rejected for the ten channel circuitry

does not apply when channels are manually rejected. The auto-reject signal and manual reject signal for each channel have a common tie point as shown on Drawing 936J155.

5.2 Averaging Amplifier Circuitry

The averaging amplifiers (Schematics 936J166, 909E598, and 909E595) have the same ten signal inputs, S_0 through S_9 applied to them as previously described for the auto-reject circuitry. In addition, there are ten reject signals, R_0 through R_9, applied to each averaging module. These signals, R_0 through R_9, originate in the auto-reject modules or the manual reject patchboard. There are two redundant averagers. Each averager is comprised of an averager module, a high gain operational amplifier, and a transistor switch.

The following description is with respect to A1 on Drawings listed above. Resistors R_1, R_3, R_5, R_7, R_9, R_{11}, R_{13}, R_{15}, R_{17}, and R_{19} are the input resistors and R_2, R_4, R_6, R_8, R_{10}, R_{12}, R_{14}, R_{16}, R_{18}, and R_{20} the feedback resistors. These are paired: R_1 and R_2, R_3 and R_4, R_5 and R_6, etc. When all of the rejection circuits are in the not rejected state, the input resistance is the parallel combination of all ten input resistors, 50K, and the feedback resistance likewise the parallel combination of all ten feedback resistors, 50K. The gain of the operational amplifier in the averager is unity with the output equal to the average of the ten input signals.

When one of the reject field effect opens, the input and feedback resistors associated with that reject switch, R_1 and R_2 with Q_1, R_3 and R_4 with Q_2, R_5 and R_6 with Q_3, etc., are both disconnected. If Q_1 opens, R_1 and R_2 are disconnected from the operational amplifier input. The input resistance is now 55.55K and the feedback resistance is the parallel combination of the nine remaining resistors, R_4, R_6, R_{10}, R_{12}, R_{14}, R_{16}, R_{18}, and R_{20}, 55.55K, keeping the gain of the overall circuit at unity while making the output the average the remaining nine inputs. This rejection of field effect transistors, input resistors, and output resistors has a reject limit of six controlled by the reject limit switch in the lockdown circuit. After rejection of six channels occurs, the averager operates on the inputs of the remaining four channels regardless of their signal level. The circuitry into the AR1 amplifier negative input, including the 20 Meg resistor and potentiometer R_2, provides the amplifier current offset adjustment while voltage offset

adjustment is accomplished via potentiometer R_1. The output of the operational amplifier is passed through transistor switch Q_{11} which is turned on when in the not rejected state. At this point the signal is split to feed through diodes CR11, CR1, and CR2. Absolute error between the input signal (S_0 through S_9) and signal average ($S_{avg.}$) is minimized by adjusting the 50K pot R_3. This adjustment makes the average signal output a true average of the signal inputs. The control average signal is sent to both the auctioneer circuit and the auto-reject circuit. When either averager A or averager B is rejected, it can be reset by pressing the reset button on front of the panel.

5.3 Auctioneer Circuitry

The auctioneer circuit (Schematics 936J155, 909E597, 909E590, and 909E594) is comprised of the high signal selector, Comparator A, Comparator B, and a follower amplifier.

The high signal selector is shown on Schematic Drawing 909E594. Field effect switches are used for passing and rejecting the ten input signals. Ten input signals, S_0 through S_9 are connected to the drain terminal of the field effect transistor. Ten reject signals are connected to the gate terminal of the field effect transistor. The field effect transistors pass all signals to a common bus when R_0 through R_9 signal voltages are approximately -10VDC (non-rejecting voltage). Input signals are rejected when reject signals are approximately +11 VDC (rejecting voltage). Since all outputs at the source terminal of the field effect transistors are on a common bus, it passes the highest output signal voltage to the comparators.

The comparator A is shown on Schematic Drawing 909E590. The comparator inputs consist of the averager signal, the high signal select signal, and an inhibit signal. The compare average signal and high signal select signal are summed and the resulting signal is applied to the base of Q_2. Normally, Q_1, Q_2, Q_3, Q_5, and Q_6 are in the non-conducting state and Q_4 is conducting. The normal output at Pin 17 (Reject Avg.) under normal conditions stated above is < -8.0 VDC, output at Pin 16 (Reject Avg. Indicate) is $< +0.6$ VDC. Potentiometer R_3 is set to a value which turns Q_2 on when the positive compare average signal ($S_{avg.} = +9.5$) exceeds the negative high signal select signal ($S_H = 7.7$) at the summing point

by approximately 1.8 VDC. Under these conditions, Q_2, Q_3, Q_5, and Q_6 are conducting and Q_1 and Q_4 are not conducting. The output at Pin 17 (Reject Avg.) is >+8 VDC. This >+8 VDC turns the transistor switch in the averager module off and Channel A is rejected. The voltage at Pin 16 (Reject Avg. Indicate) is >8 VDC and actuates the lamp relay which indicates that Channel A has been rejected. When Channel "A" is rejected Channel B cannot be rejected because the inhibit signal at Pin 9 on Comparator A is <+1.2 VDC and is applied to Pin 12 of Comparator B. This turns on the field effect transistor Q_1 and provides a ground path for all input signals. Comparator B, therefore, cannot be rejected. A manual reset switch on the front of the panel restores Comparator A to service by returning the reject average indicate signal to ground potential causing Q_1, Q_2, Q_3, Q_5, and Q_6 to return to their original non-conducting state.

The follower AR1 is a unity gain non-inverting operational amplifier which provides a buffered average signal output of 0 to (+10 VDC) to connector J5. This signal output is used to provide a signal to the temperature indicator on the ATE Console. This signal is also used to activate the alarm circuits in the LRE Component Chassis.

The unbuffered output signal of 0 - (+10 V) is connected to connector J5. This output signal is used as a control signal input to the Power Temperature Controller Chassis in Rack 48 for the ECS 10 channel averager (936J154G01).

5.4 Complementary Circuitry

The complementary circuit (Schematics 936J155, 909E599, 909E593, and 909E591) is comprised of a lockdown circuit, a trigger module, a one shot module, and an operational amplifier.

The lockdown circuit is shown on Schematic Drawing 909E599. The ten reject signals, R_0 through R_9, which are generated in the auto-reject modules, serve as inputs to the ten potentiometer and resistor combinations. A positive 15 VDC is applied, by a single pole, seven throw, rotary reject limit switch, to the seven potentiometer and resistor combinations called Reject Limit. Initially all reject module inputs, R_0 through R_9, are <-10 VDC (non-reject voltage). When the reject limit switch is in position zero (+15 VDC connected to Pin 18), this means that no rejections are permitted. The circuit is set

up so that when no rejections are permitted, the voltage at TP1 is -4 Volts. This voltage represents zero rejects. The trigger module is set to trigger at -3.7VDC at TP-1 and, therefore, the trigger circuit has already triggered. This results in the lockdown voltage at TP3 changing from >+7.5 VDC to <- 7.5 VDC and the lockdown voltage at TP4 changing from <- 7.5 VDC to >+7.5 VDC. These lockdown voltages serve as inputs to the auto-reject modules and make automatic rejection impossible when polarity of voltage is as described above. When the reject limit switch is set at position one, only one reject is permitted. The voltage at TP1 when one reject module is rejected is -5 Volts DC, and the trigger circuit is set to trigger at -4.7 VDC at TP1. This voltage level is reached when one reject module is rejected causing a +11.3 VDC to be applied to one of the reject inputs. The pots and resistors are calibrated so that when one reject signal of approximately +11.3 VDC is applied in place of the non-rejected signal (approximately -10 VDC) this change at the input to the inverting operational amplifier causes a change of one volt to occur at the output of the amplifier. The voltage, therefore, changes from -4 VDC to -5 VDC. This signal represents one reject. Additional rejects may be permitted up to a total of six by setting the reject limit switch to position six. The number of rejects is displayed on a meter in the ATE Console. The positive 15 VDC, R_3, R_4, and C_1, which are connected to input and output of the operational amplifier serve as a voltage offset circuit to adjust the output of the amplifier to -4 VDC when no rejections are applied to the input. When six rejections are present, the voltage at TP1 is -10 V.

The trigger circuit module (Schematic 909E593 and 909E599) has, at its input terminal Pin 2, adjustable potentiometer and resistor combinations which preset the voltage trip level. When the reject limit switch is set at 0, this applies +15 VDC to Pin 18. R_{15} through R_{21} are adjusted for minimum resistance. The trigger module is originally in the normal untriggered state with Q_1, Q_2, Q_4 in the conducting state and Q_3 and Q_5 in the non-conducting state. Output at Pin 7 is >+7.5 VDC and output at Pin 8 is <-7.5 VDC when trigger is in untriggered state. R_2 is adjusted so that -3.7 VDC is present at TP1. R_{15} is then adjusted until the trigger module changes state. The output at Pin 7 changes from >+7.5 VDC to <-7.5 VDC. The output at Pin 8 changes from <-7.5 VDC to >+7.5 VDC.

Q_1, Q_2, Q_4 are non-conducting, and Q_3 and Q_5 are now conducting.

R_2 is then adjusted until TP1 is -4.7 VDC. The trigger returns to its original state with >+7.5 VDC at Pin 7 and <-7.5 VDC at Pin 8. The reject limit switch is then set at position 1. This applies +15 V to Pin 15. R_{16} is then adjusted until the trigger circuit changes state with outputs of <-7.5 VDC at Pin 7 and >+7.5 VDC at Pin 8.

The same adjustments are made for the remainder of the potentiometers progressing one volt more negative at TP1 each time the position of the reject limit switch is changed. When the reject limit switch is in position 6, the voltage at TP1 is -9.70 VDC. The trigger circuit can be preset to trip at any reject limit from 0 to 6 by setting the reject limit switch to the desired number of rejects.

The one shot module (Schematic 909E591) is a manually actuated reset device which develops a pulse of approximately +15 VDC for a period of approximately 50 micro seconds. This pulse is applied to all the auto-reject modules causing the silicon controlled rectifier (Q_7) in each module to return to the non-conducting state. If the rejection was a result of transients the auto-reject module will remain in the non-rejected state. If the rejection was a result of signals varying outside the preset $\pm$1 VDC bandwidth, the auto-reject module returns to its original rejected state after the 50 micro second pulse from the one shot module has been completed.

A lamp relay module on the front panel is energized when lockdown is in effect. External lockdown indication is available at connector J5.

6.0 OPERATING INSTRUCTIONS

Once the 10 channel averagers have been installed, a series of operational checkouts must be made. If checkout reveals signal levels are not within given tolerances, adjustments must be made.

However, after these adjustments have been completed, no further manipulation is necessary except for routine calibration checks and preventive maintenance (see Maintenance Instructions). Controls, adjustments, and operational test procedures follow here.

7.0 CONTROL-OPERATIONAL AND SEMI-PERMANENT

To limit the access to alignment controls, all operating controls have, except for the power fuses, reject limit switches, reset switch, and lamp verify switch have been placed on a component panel inside the 10 channel averager chassis or top mounted on the various component cards.

8.0 FRONT PANEL (See Figure 2)

8.1 Fuses

Two 1.5 ampere fuses, and one 0.38 ampere fuses are located on the front panel in their fuseholders. The +15 VDC and the +28 VDC fuseholders are fused with 1.5 ampere and the -15 VDC fuseholder is fused with a 0.38 ampere fuse.

8.2 Reject Switches, Rotary

There are five single pole, seven throw, three deck rotary switches on the front panel. Each switch controls the manual rejection limit for each station.

8.3 Reset Switch

There is one DPDT reset switch on the front panel which actuates relay K2 (Drawing 936J155). Normally open contact K2A closes causing the one shot module to fire, resetting the auto-reject modules. Normally open contact K2B closes causing the reset average indicate signal output of the comparators to be grounded thereby restoring the rejected comparator to the non-rejected state. A remote reset switch on the ATE Console is connected through connector J3.

8.4 Lamp Verify Switch

This is a Master Specialties Series 10E switch-indicator which energizes all lights on the front panel when actuated.

9.0 COMPONENT PANEL (See Figure 1)

Sixty-one test points are located on the component panel on the top and front of each 10 channel averager. These are clearly identified and are for the following services:

9.1 Test Points

There are five stations in the ten channel averager chassis. Each station has ten signal input test points (S_0 through S_9) and five station average output test points ($S_{avg.\ 1}$ through $S_{avg.\ 5}$).

There are also four test points for the power inputs and two test points for I and C commons.

9.2 Manual Reject Patchboard

This patchboard has provision for manually rejecting fifty channels. There are five stations in each chassis and each station has ten reject channels. Pins are inserted into the holes in the patchboard causing a $>+10$ V reject voltage to be applied to averaging amplifier circuit, auctioneer circuit, and lockdown circuit.

9.3 Checkout-Simulate Operate Switch (Schematic Drawing 936J155)

This is a six deck, 72 pole, double throw switch. Its function is to switch from the normal operational mode to a checkout mode. When in the operate position, the signals from the engine thermocouples are connected to the 10 channel averager inputs. If a positive 28 volts is applied to the simulate relay K1 when the C/O switch is in the operate position, signal inputs from the simulator may be applied to ten channel averager. When the switch is in the checkout position, signals from external power sources may be inserted into the ten channel averager and a checkout of circuits may be conducted.

10.0 OPERATIONAL CHECKOUT

After the chassis has been installed it should be checked out in accordance with the applicable sections of Test Specification Number T-711858 and T-711860.

11.0 MAINTENANCE INSTRUCTIONS

11.1 Preventive Maintenance

Under normal conditions, no routine replacement of parts should be necessary. Good housekeeping practices include periodic dusting, cleaning, inspection, and the like. Since the circuitry is low voltage, leakage is a lesser problem, however, dust and moisture always make this a potential problem. Consequently, it is advisable to be sure the components in the chassis are free of dust and moisture at all times.

11.2 Corrective Maintenance

Corrective maintenance, in depth, is performed at the factory, or by the Westinghouse field representative. Local corrective measures, however, may if necessary be performed at the skilled technician level. Standard isolation procedures and techniques are applicable. The alignment and test equipment specified in Test Specification T-711858 and T-711860 suffice to determine a faulty component or circuit. Initial symptoms of malfunction and correction action are:

Symptom	Action
Blown Fuses	Replace
Loose Controls	Tighten
Off-Voltages at Test Points	Check Mains
Overheating Smoke and Odors	Examine for shorts in load or output cables
Intermittents	High resistance joints or loose connections

If any of the preceeding symptoms persist, it is an indication of deepseated malfunction and should be attended to at the using facility or rectified by the factory field representative. Minor items (non-critical capacitors and the like) may be replaced by local parts of identical value and tolerance.

12.0 DRAWING LIST

936J154	Assembly, 10 Channel Averager
936J155	Schematic, 10 Channel Averager
936J159	Wiring Diagram, 10 Channel Averager
909E598	Assembly, Averaging Amplifier Module
909E597	Assembly, Auctioneer Module
909E596	Assembly, Auto-Reject Module
909E599	Assembly, Complementary Module
979D426	Assembly, Lamp Relay Module

979D181	Assembly, Grounding Module
979D962	Assembly, Diode Component Card
979D963	Assembly, Diode Component Card (Reset)
979D182	Assembly, Extender Printed Circuit Board
979D442	Assembly, Fuseholder Module
979D550	Assembly, Cable Assembly
979D551	Assembly, Cable Assembly
979D552	Assembly, Cable Assembly
979D524	Assembly, Cable Assembly
978D991	Assembly, Cable Assembly
909E506	Assembly, Comparator Module
909E594	Assembly, High Signal Select Module
909E595	Assembly, Multi Channel Averager Module
909E592	Assembly, Auto Reject Module
909E593	Assembly, Trigger Circuit Module
909E591	Assembly, One Shot Module

13.0 ACCEPTANCE TEST PROCEDURE FOR 10 CHANNEL AVERAGER CHASSIS

Each unit has been calibrated and tested and must comply with the limits of WANL Specification Number T-711858 and T-711860 which follows.

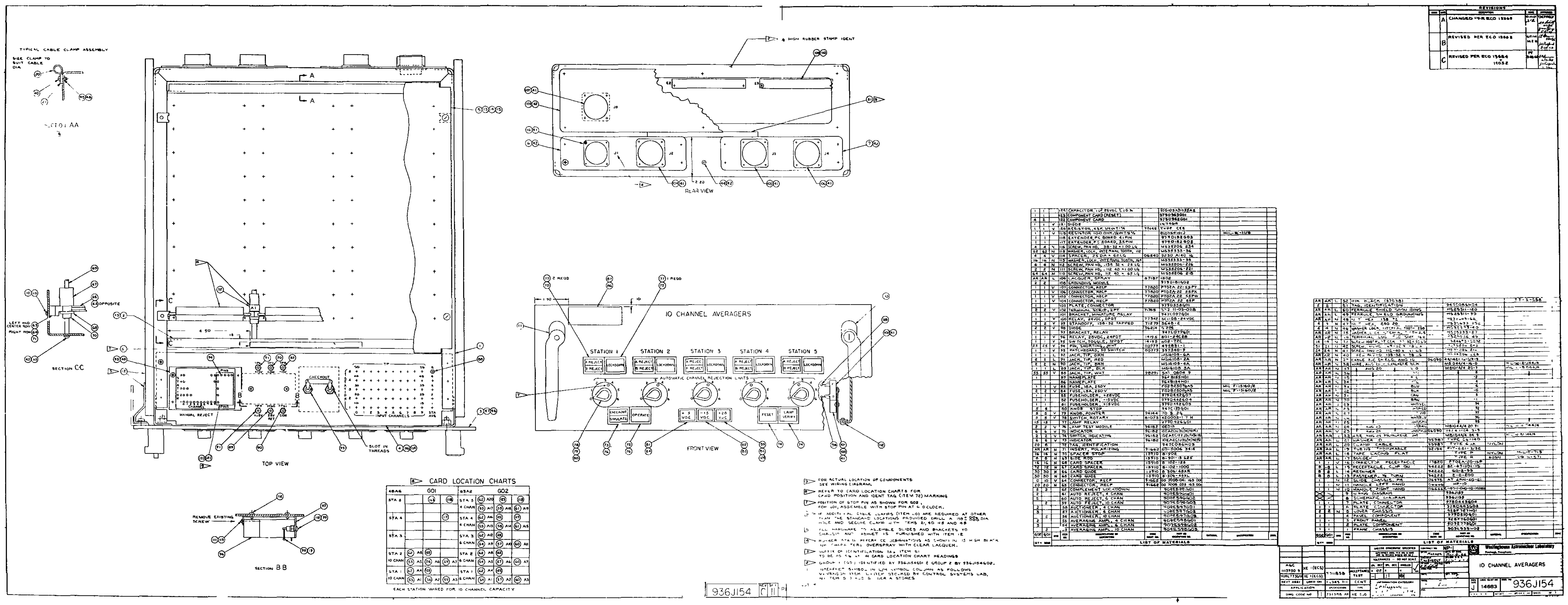
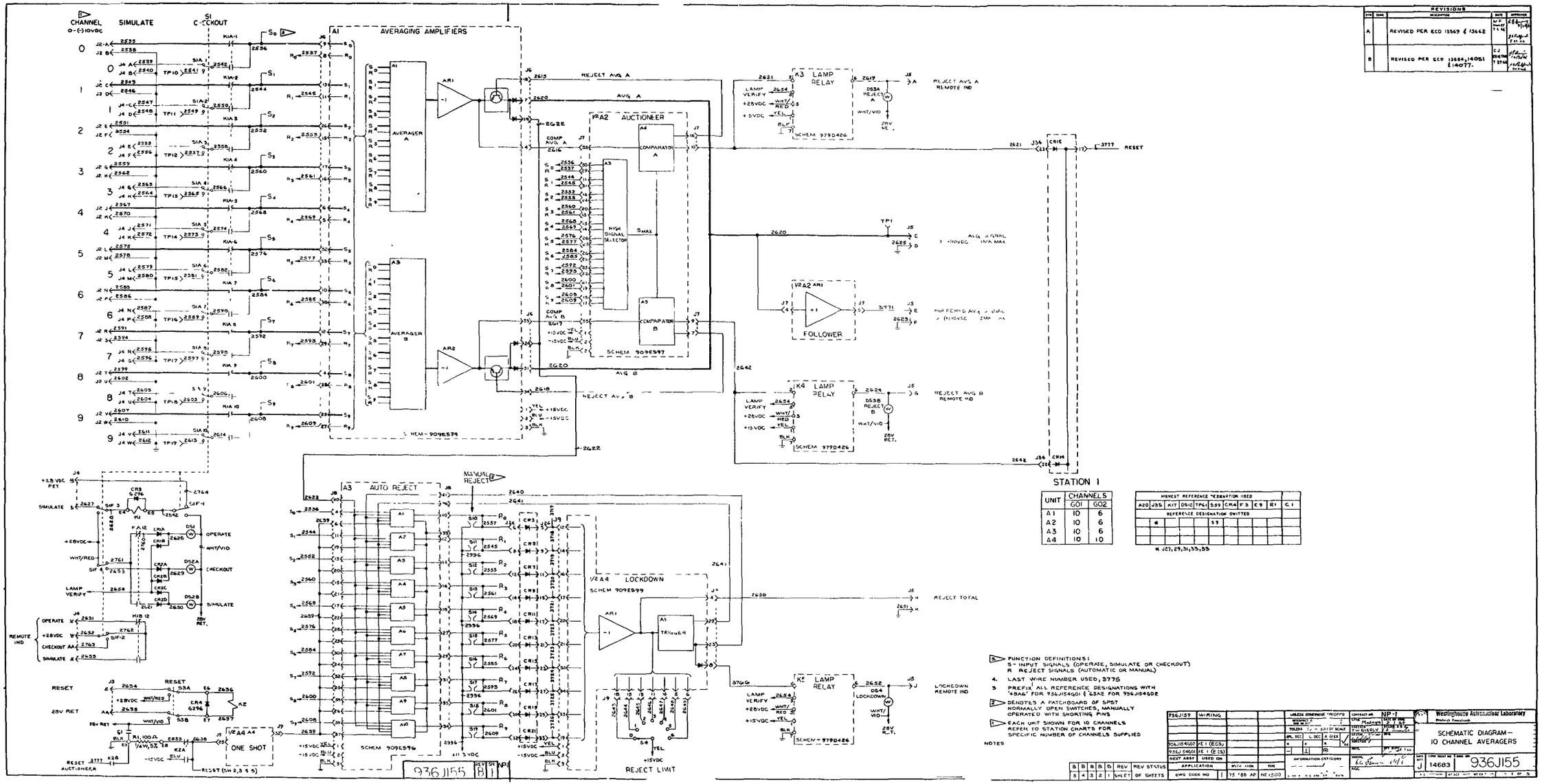


Figure 3

Drawing No. 936J154 - Rev. C

10 Channel Averager Main Assembly



REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVED
A		REVISED PER ECO 13569 & 13462		
B		REVISED PER ECO 13686, 14051 & 14077.		

UNIT	CHANNELS G01	CHANNELS G02
A1	10	6
A2	10	6
A3	10	6
A4	10	10

HIGHEST REFERENCE DESIGNATION USED									
A20	J35	K17	DS12	TP41	S39	CR44	F3	E9	R21	C1
REFERENCE DESIGNATION OMITTED									

* J27, J29, J31, J33, J35

1. FUNCTION DEFINITIONS: S = INPUT SIGNALS (OPERATE, SIMULATE OR CHECKOUT) R = REJECT SIGNALS (AUTOMATIC OR MANUAL)
4. LAST WIRE NUMBER USED, 3775
5. PREFIX ALL REFERENCE DESIGNATIONS WITH "936J" FOR 936J154G01 & 936J154G02
2. DENOTES A PATCHBOARD OF SPST NORMALLY OPEN SWITCHES, MANUALLY OPERATED WITH SHORTING PINS
1. EACH UNIT SHOWN FOR 10 CHANNELS REFER TO STATION CHARTS FOR SPECIFIC NUMBER OF CHANNELS SUPPLIED

NOTES

936J159	WIRING			UNLESS OTHERWISE SPECIFIED	CONTRACT NO. NP-1
				TOLER.	
936J154G01	PE 1 (EC5)				
936J154G01	PE 1 (E C5)				
NEXT ASSY	USED ON			INFORMATION CATEGORY	
APPLICATION		WITH	ITEM	TYPE	
DWG CODE NO.	1	75 788 AP	NE1500		

Westinghouse Astronuclear Laboratory

SCHEMATIC DIAGRAM — 10 CHANNEL AVERAGERS

SIZE J | CODE IDENT NO. 14683 | DRAWING NO. 936J155 | REV. B

Figure 4

Drawing No. 936J155 - Rev. B

10 Channel Averager Main Schematic Diagram (Sheet 1)

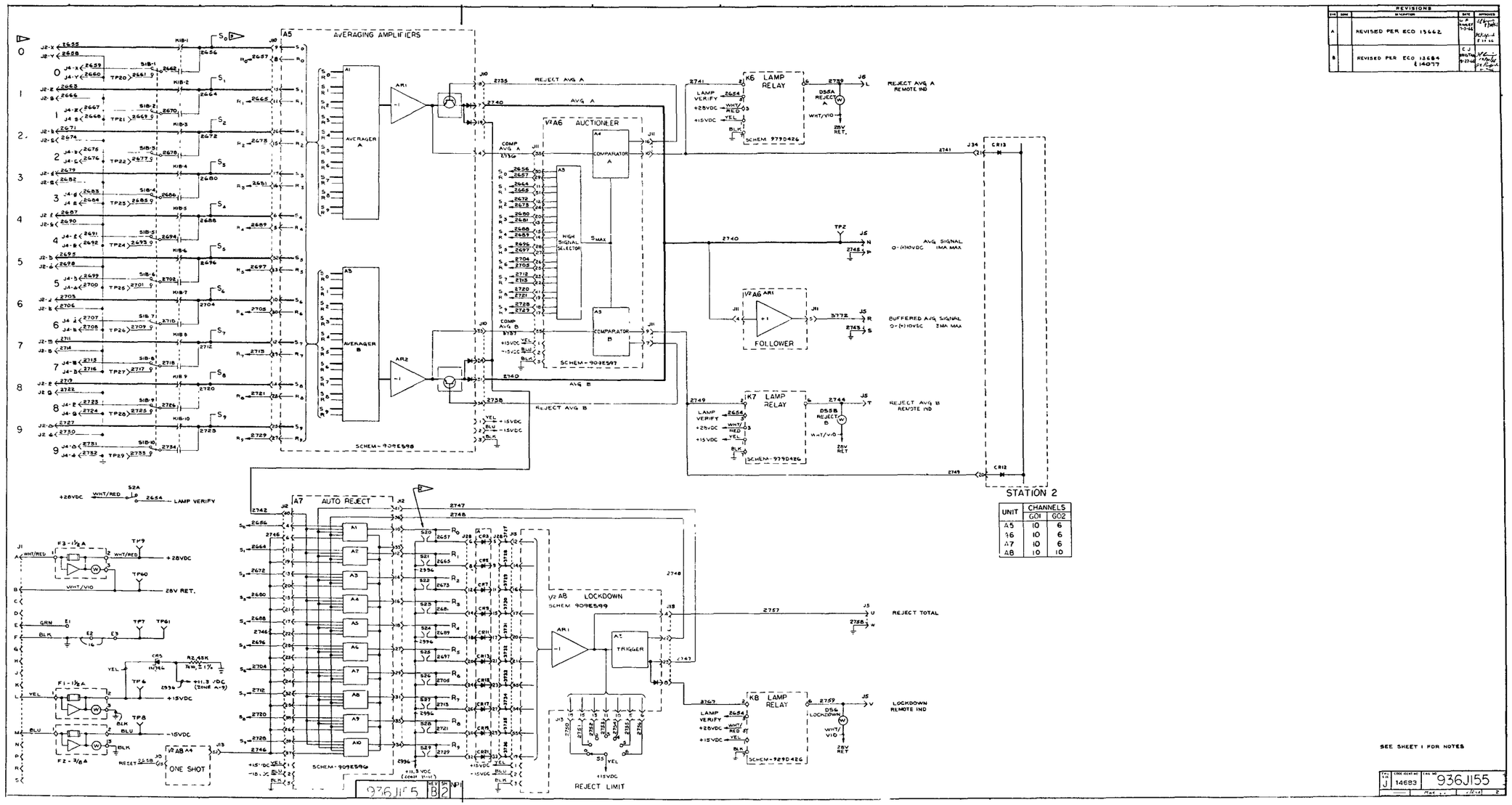
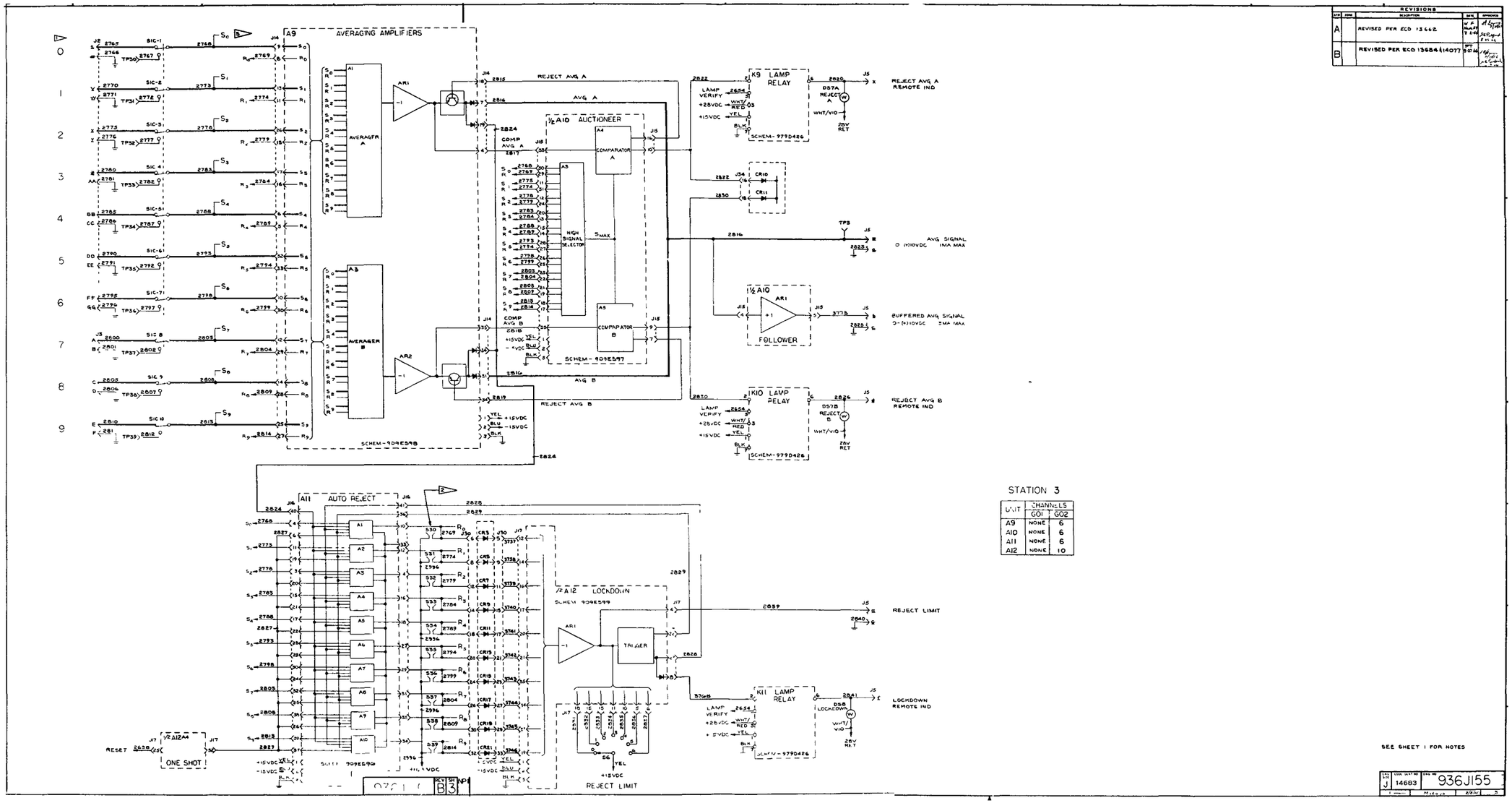


Figure 4

Drawing No. 936J155-B

10 Channel Averager Main Schematic Diagram (Sheet 2)



REVISIONS			
LTR	ZONE	DESCRIPTION	DATE / APPROVED
A		REVISED PER ECO 13668	4-6-65 / 7-2-65
B		REVISED PER ECO 13684 & 14077	SEPT 9-67-66

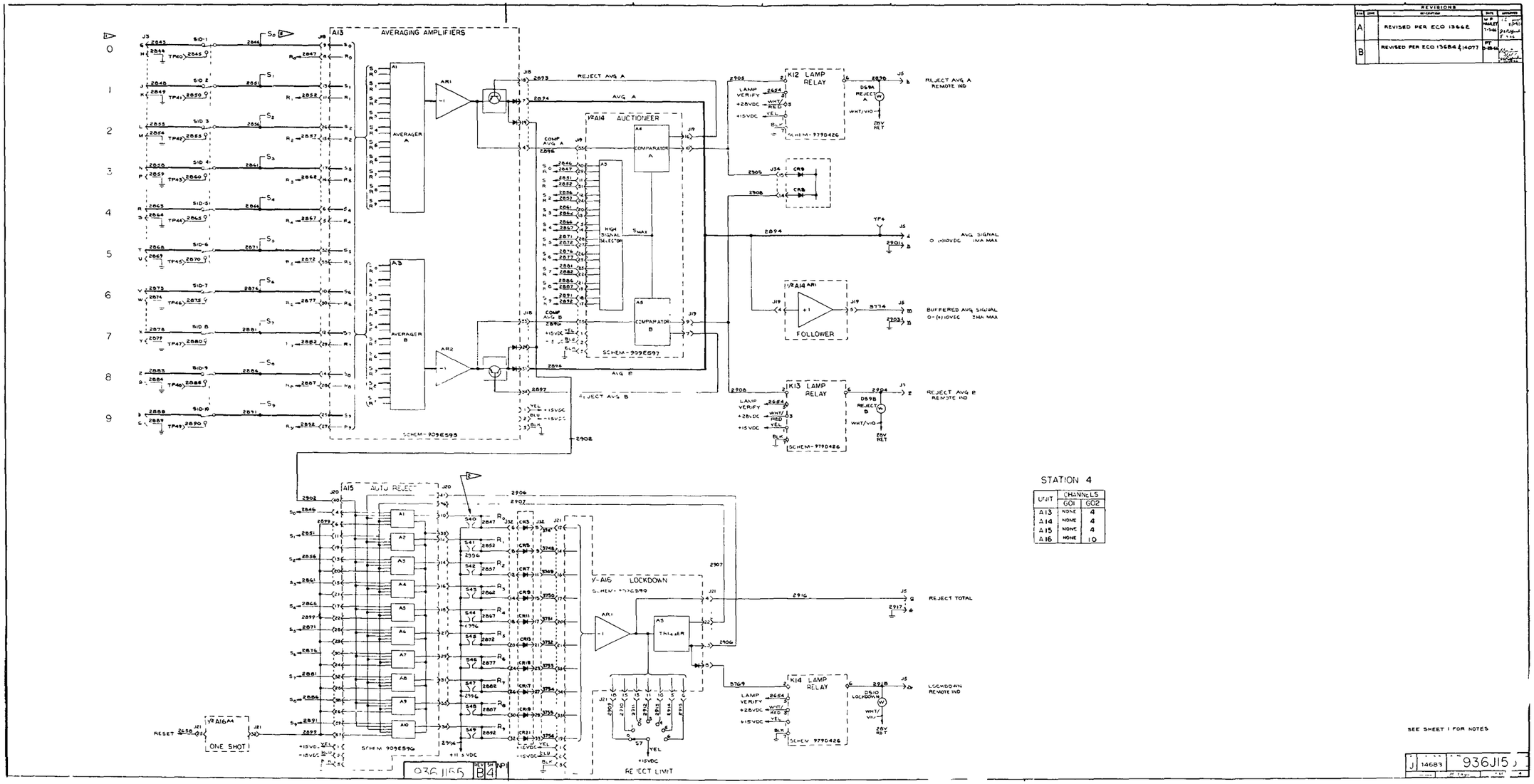
STATION 3

UNIT	CHANNELS	
	G01	G02
A9	NONE	6
A10	NONE	6
A11	NONE	6
A12	NONE	10

Figure 4

Drawing No. 936J155-Rev. B

10 Channel Averager Main Schematic Diagram (Sheet 3)



REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVED
A		REVISED PER ECO 13666	W. P. HALEY 1-3-66	
B		REVISED PER ECO 13684 & 14077	PT 9-8-66	

STATION 4

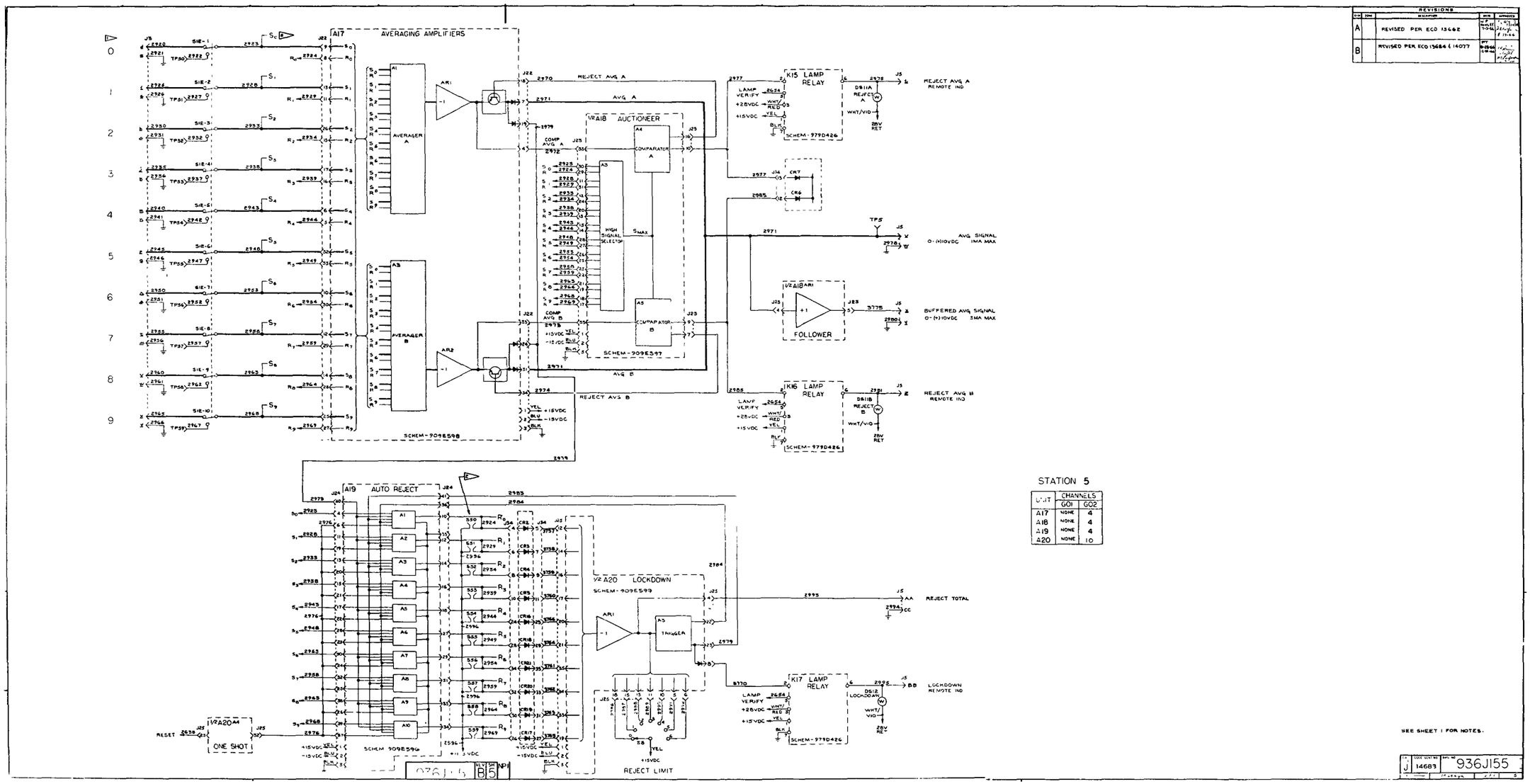
UNIT	CHANNELS	
	G01	G02
A13	NONE	4
A14	NONE	4
A15	NONE	4
A16	NONE	10

Figure 4

Drawing No. 936J155 - Rev. B

10 Channel Averager Main Schematic Diagram (Sheet 4)

19-C



REVISIONS			
LTR	ZONE	DESCRIPTION	DATE / APPROVED
A		REVISED PER ECO 13662	
B		REVISED PER ECO 13684 & 14077	

STATION 5

UNIT	CHANNELS GO1	CHANNELS GO2
A17	NONE	4
A18	NONE	4
A19	NONE	4
A20	NONE	10

Figure 4

Drawing No. 936J155 - Rev. B

10 Channel Averager Main Schematic Diagram (Sheet 5)

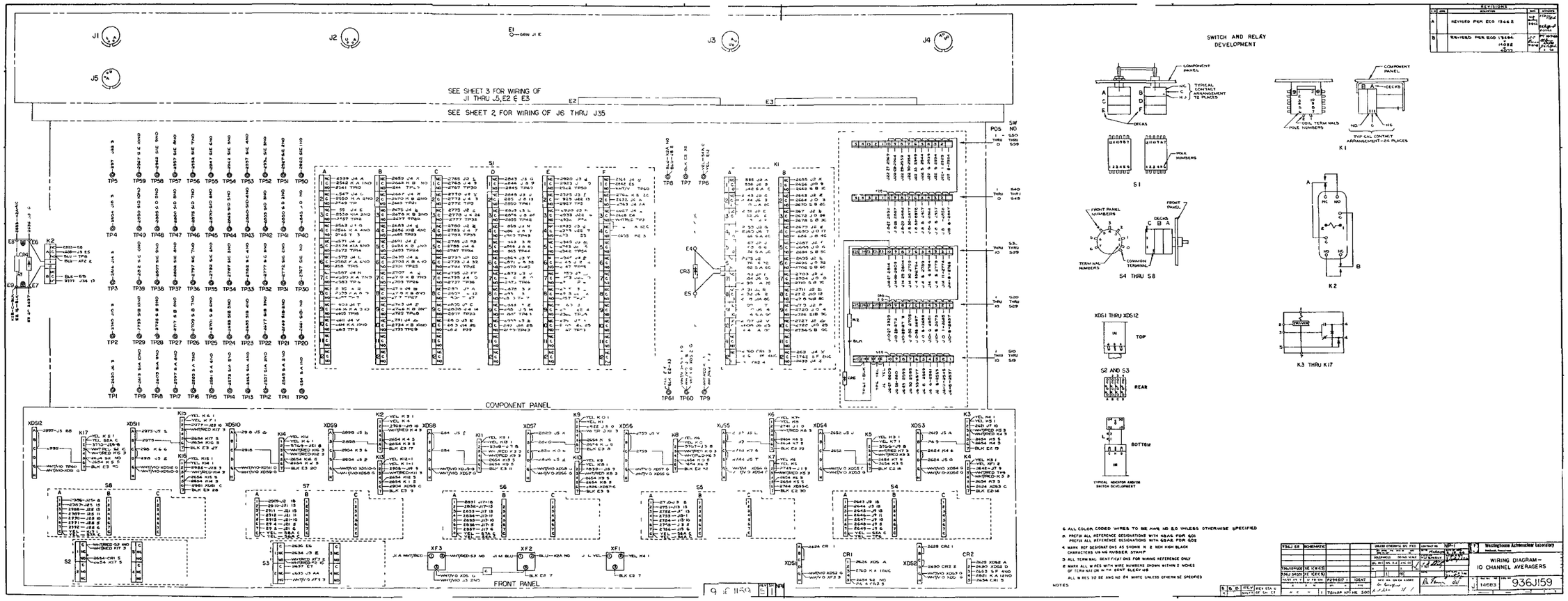


Figure 5

Drawing No. 936J159 - Rev. B

10 Channel Averager Main Wiring Diagram
(Sheet 1)

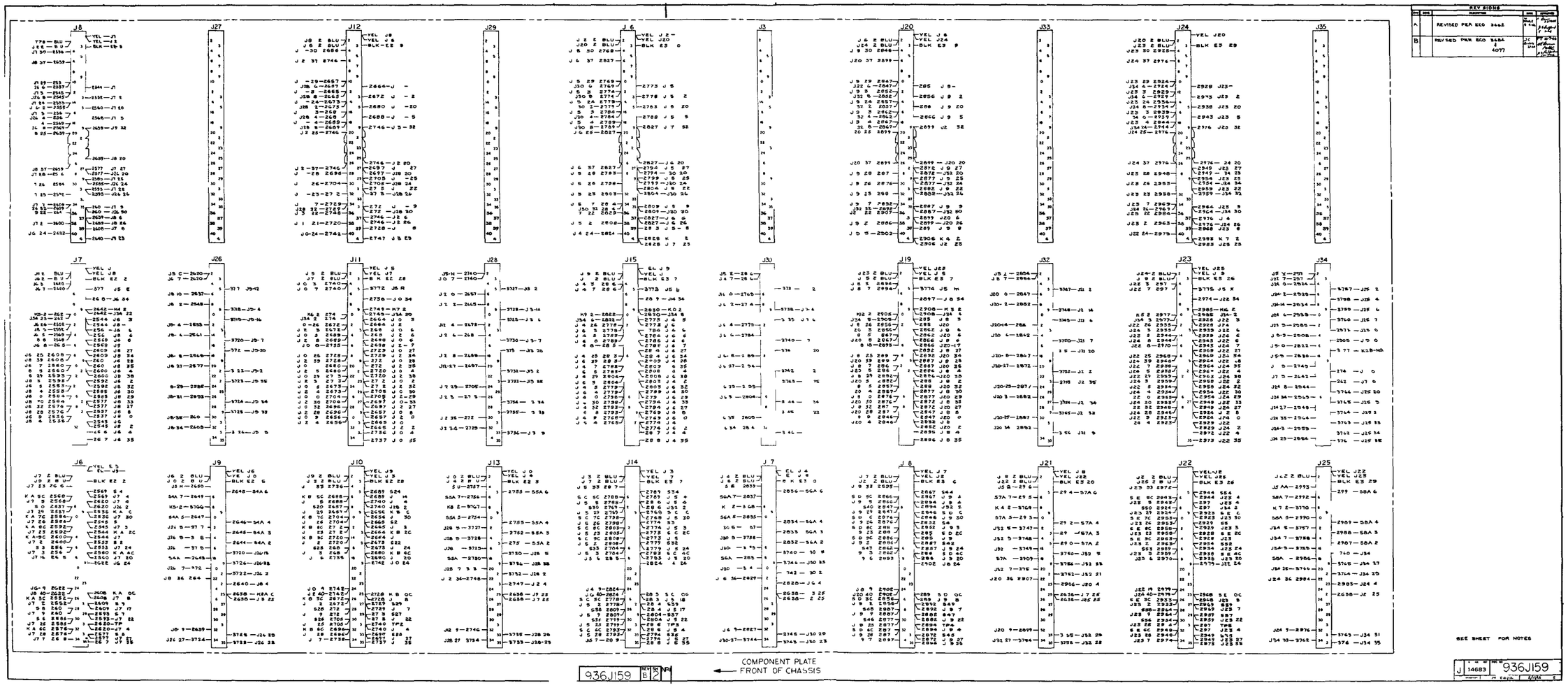


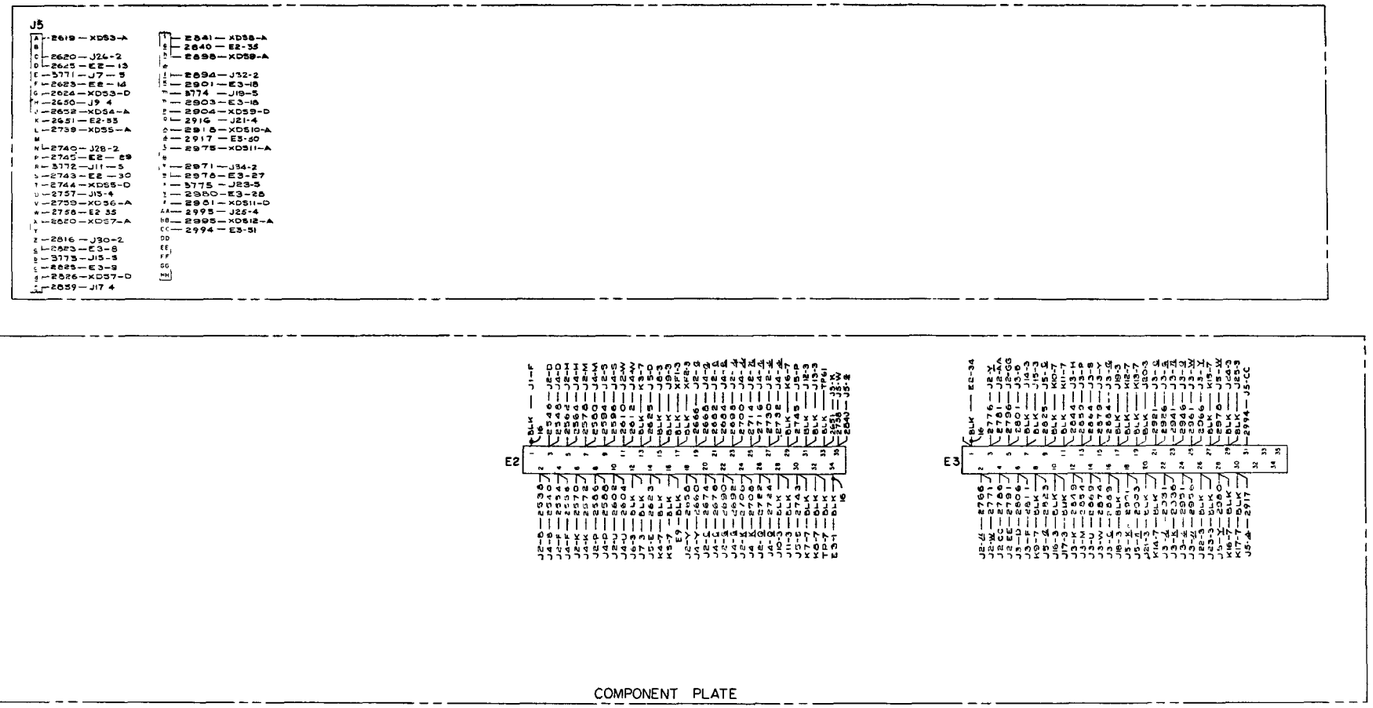
Figure 5

Drawing No. 936J159 - Rev. B

10 Channel Averager Main Wiring Diagram
(Sheet 2)

20-A

REVISIONS				
SYM	ZONE	DESCRIPTION	DATE	APPROVED
A		REVISED PER ECO 13462		
B		REVISED PER ECO 13684 & 14077		



SEE SHEET 1 FOR NOTES

936J159 REV B SH 3

J 14683 936J159

Figure 5

Drawing No. 936J159 - Rev. B

10 Channel Averager Main Wiring Diagram (Sheet 3)

20-B

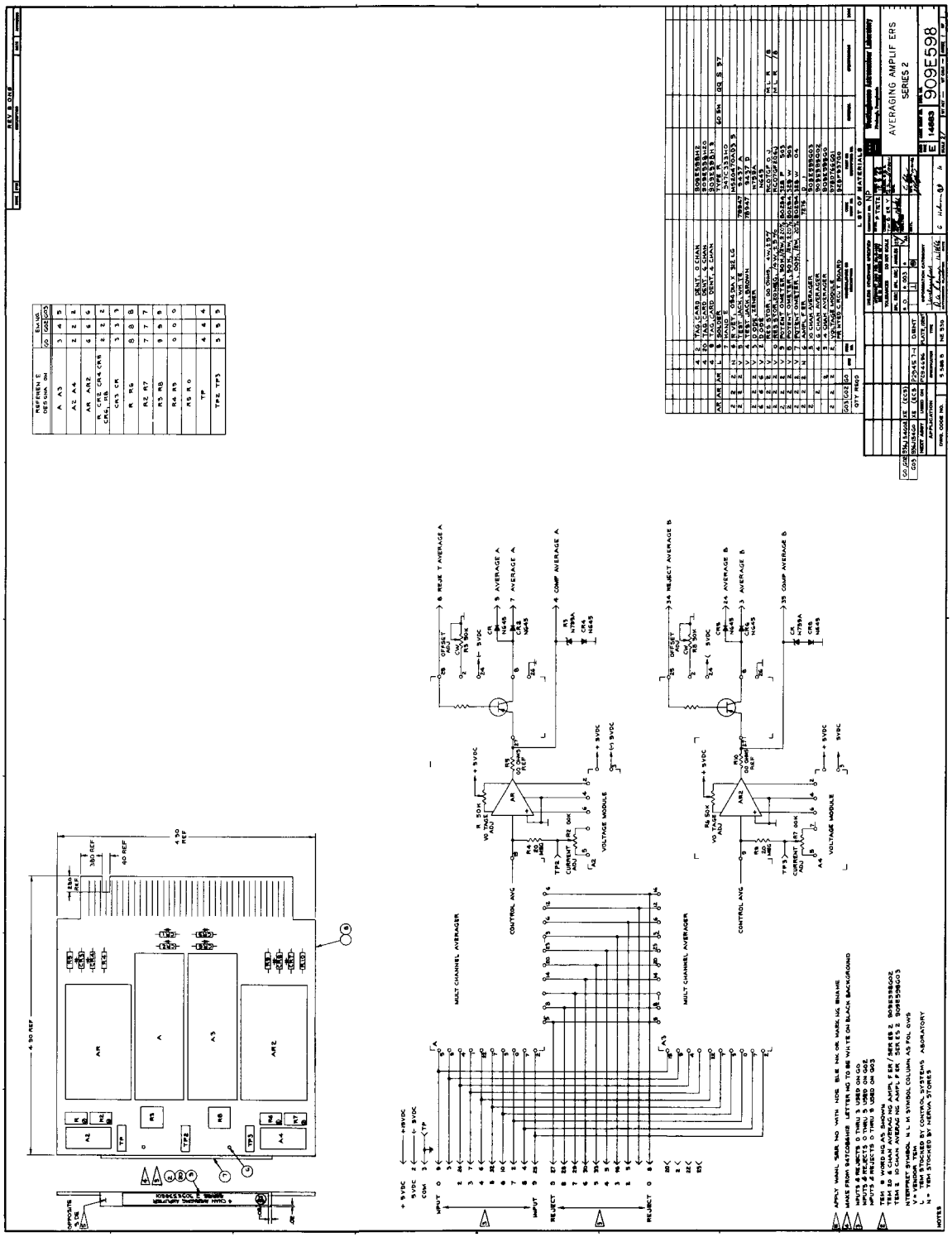


Figure 6

Drawing No. 909E598

Averaging Amplifiers Series 2
Combined Assembly & Schematic

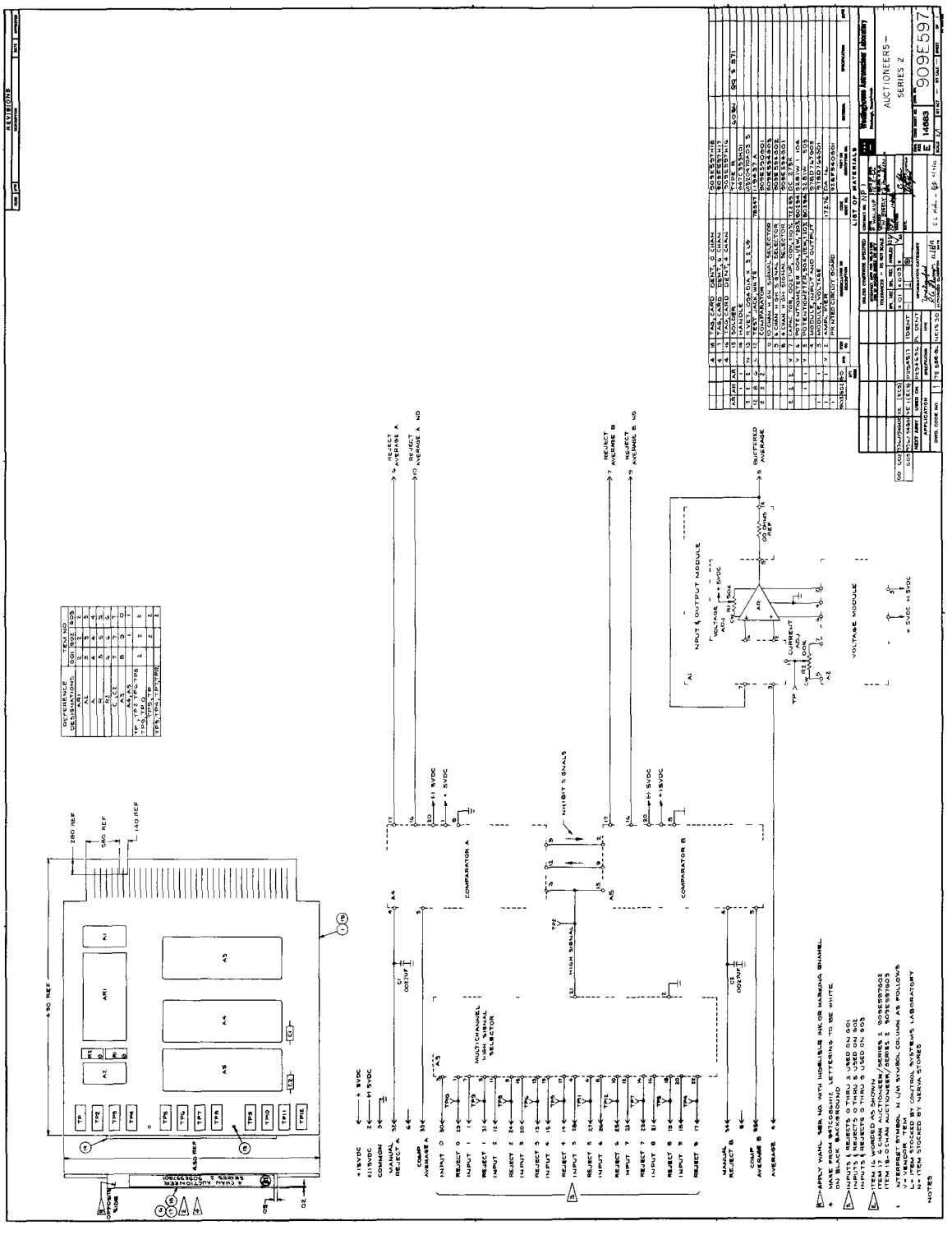


Figure 7

Drawing No. 909E597

Auctioneers Series 2
Combined Assembly & Schematic

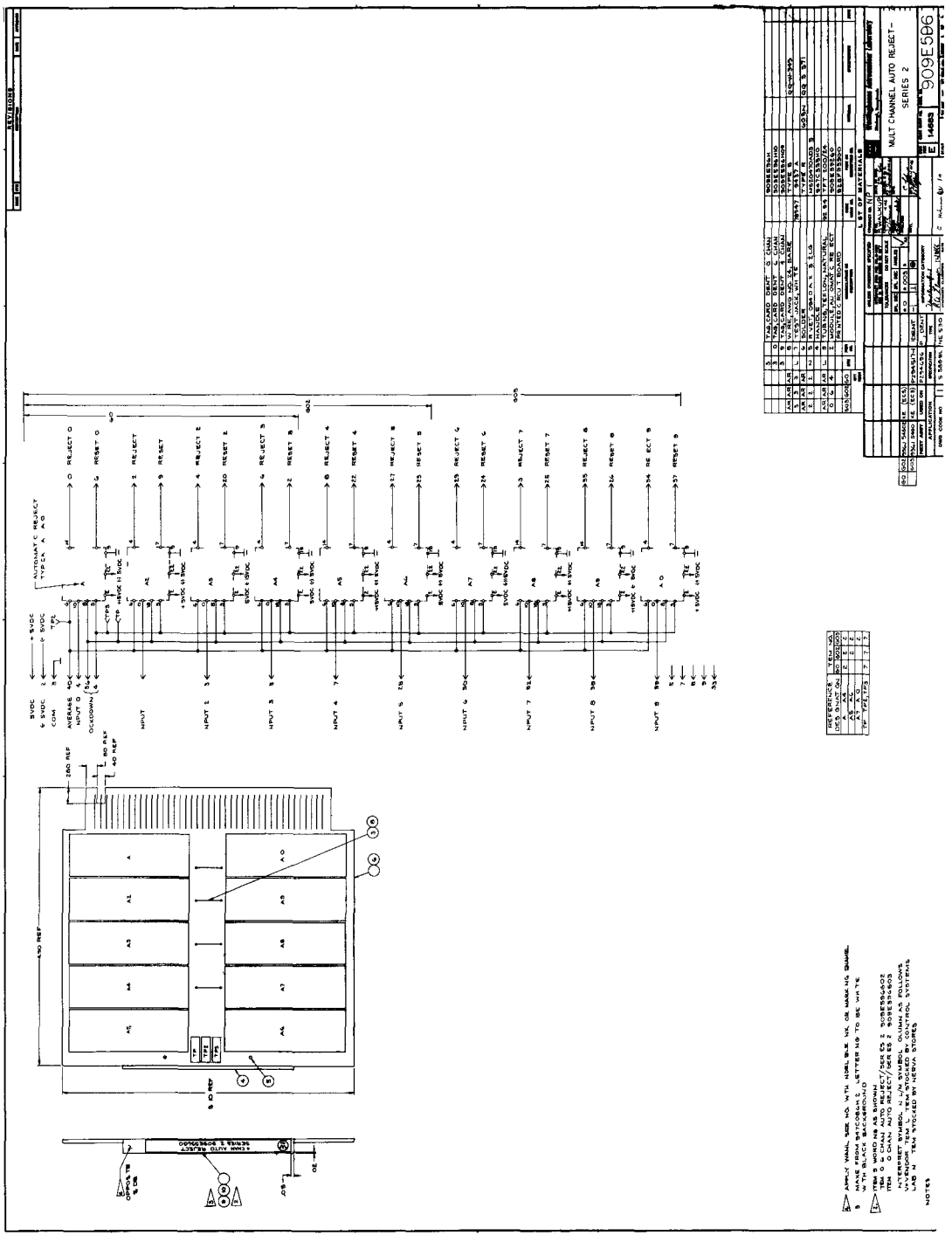


Figure 8

Drawing No. 909E596

Multichannel Auto Reject Series 2
Combined Assembly & Schematic

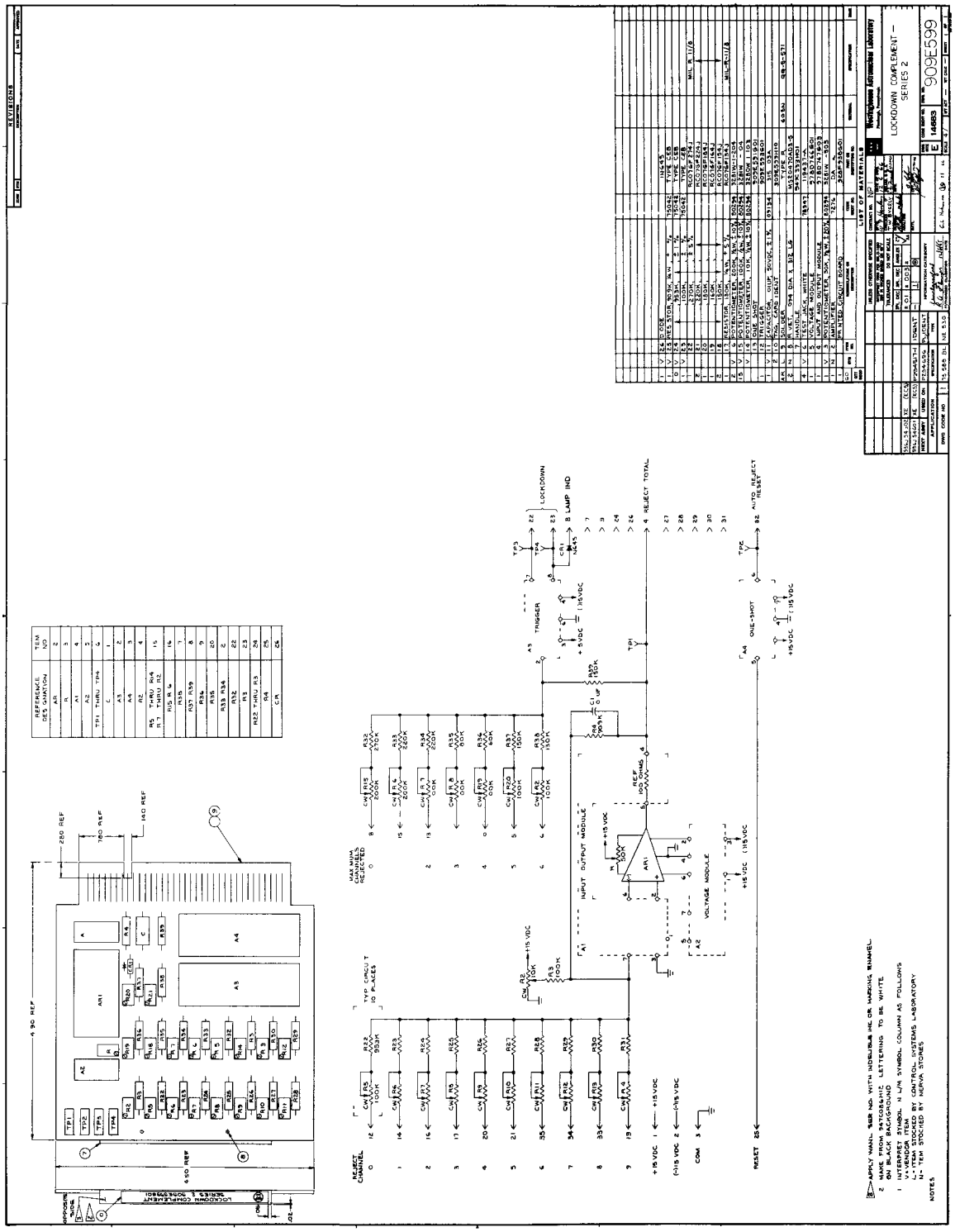


Figure 9

Drawing No. 909E599

Lockdown Complement Series 2
Combined Assembly & Schematic

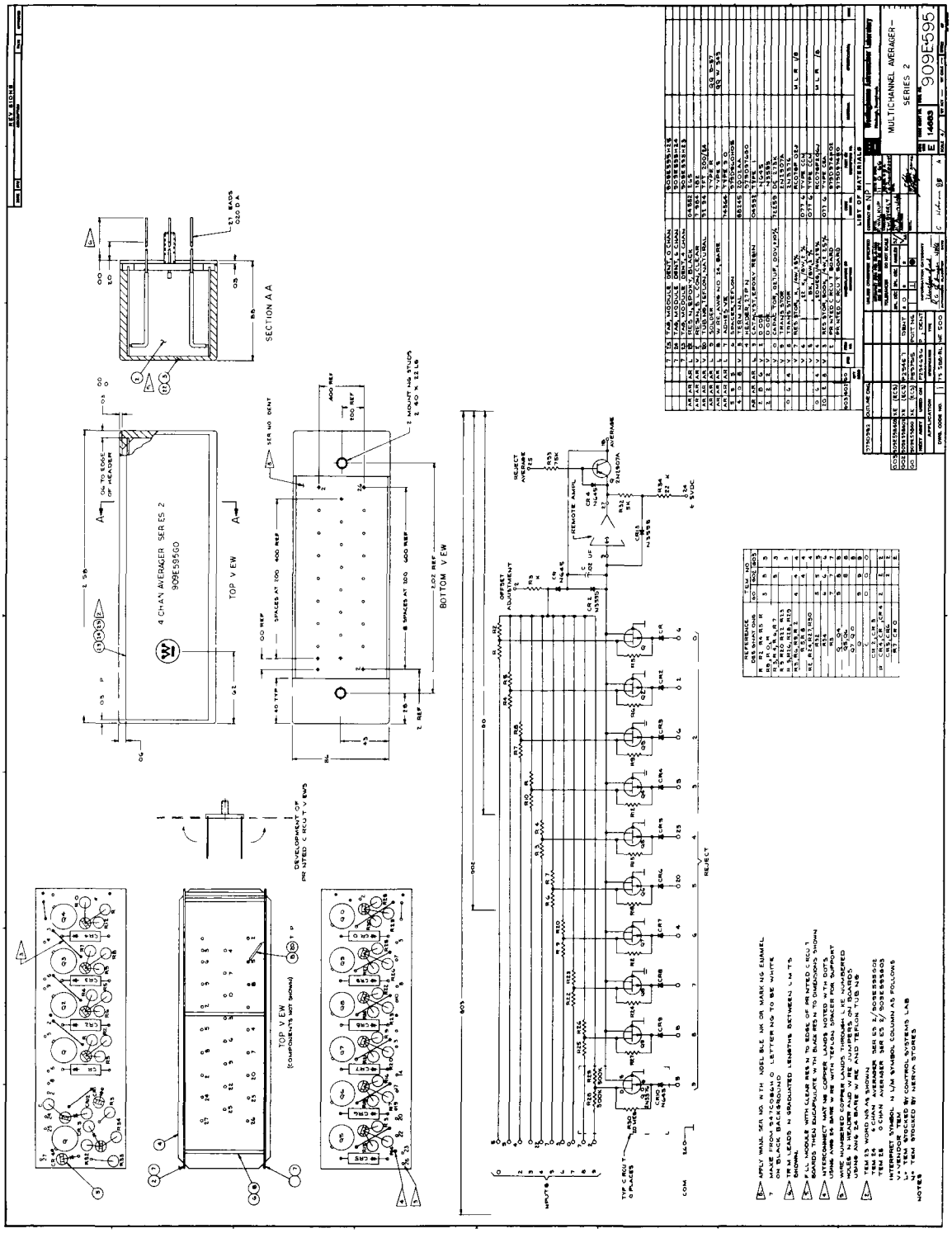


Figure 10

Drawing No. 909E595

Multichannel Averager Series 2
Combined Assembly & Schematic

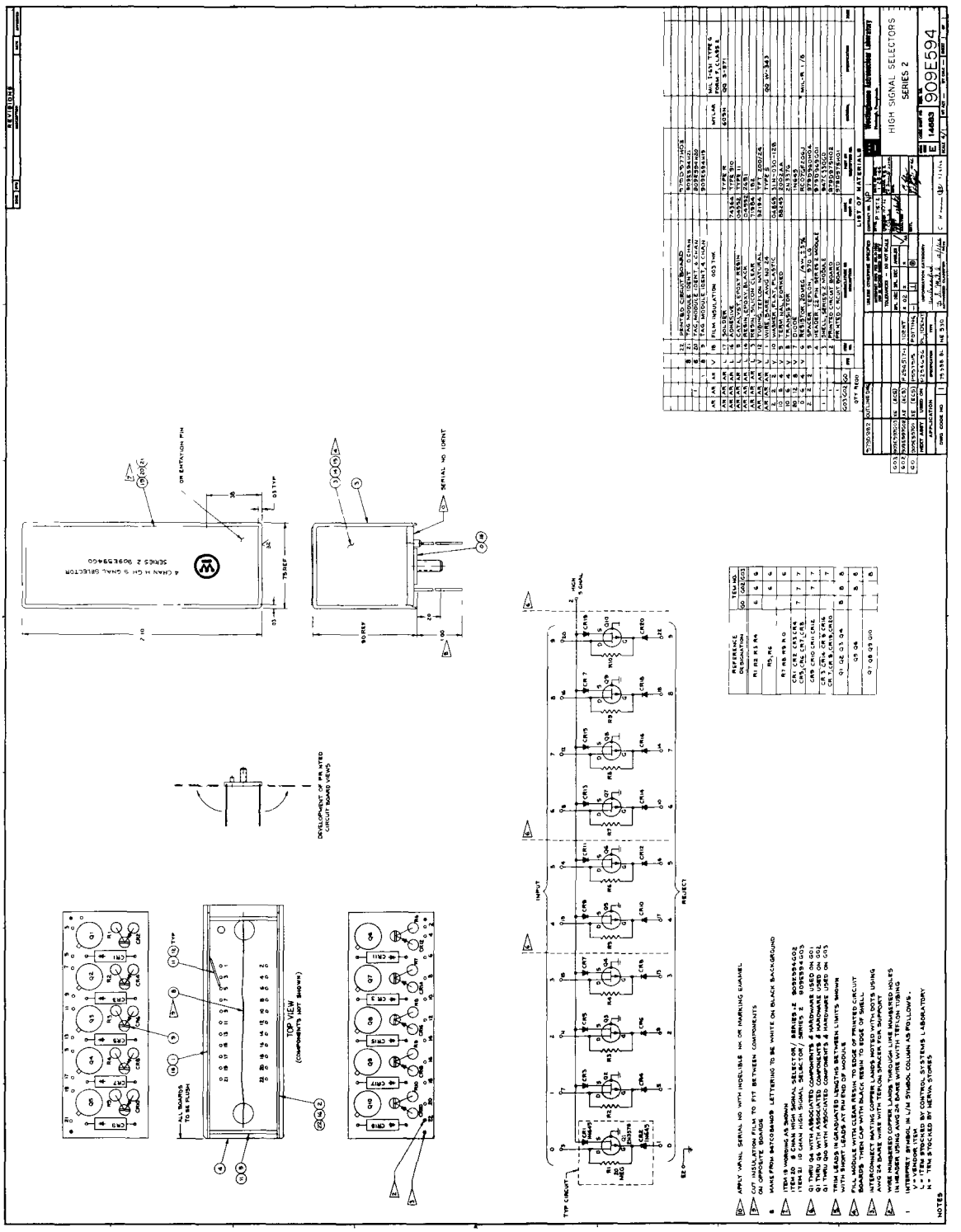


Figure 11

Drawing No. 909E594

High Signal Selectors Series 2
Combined Assembly & Schematic

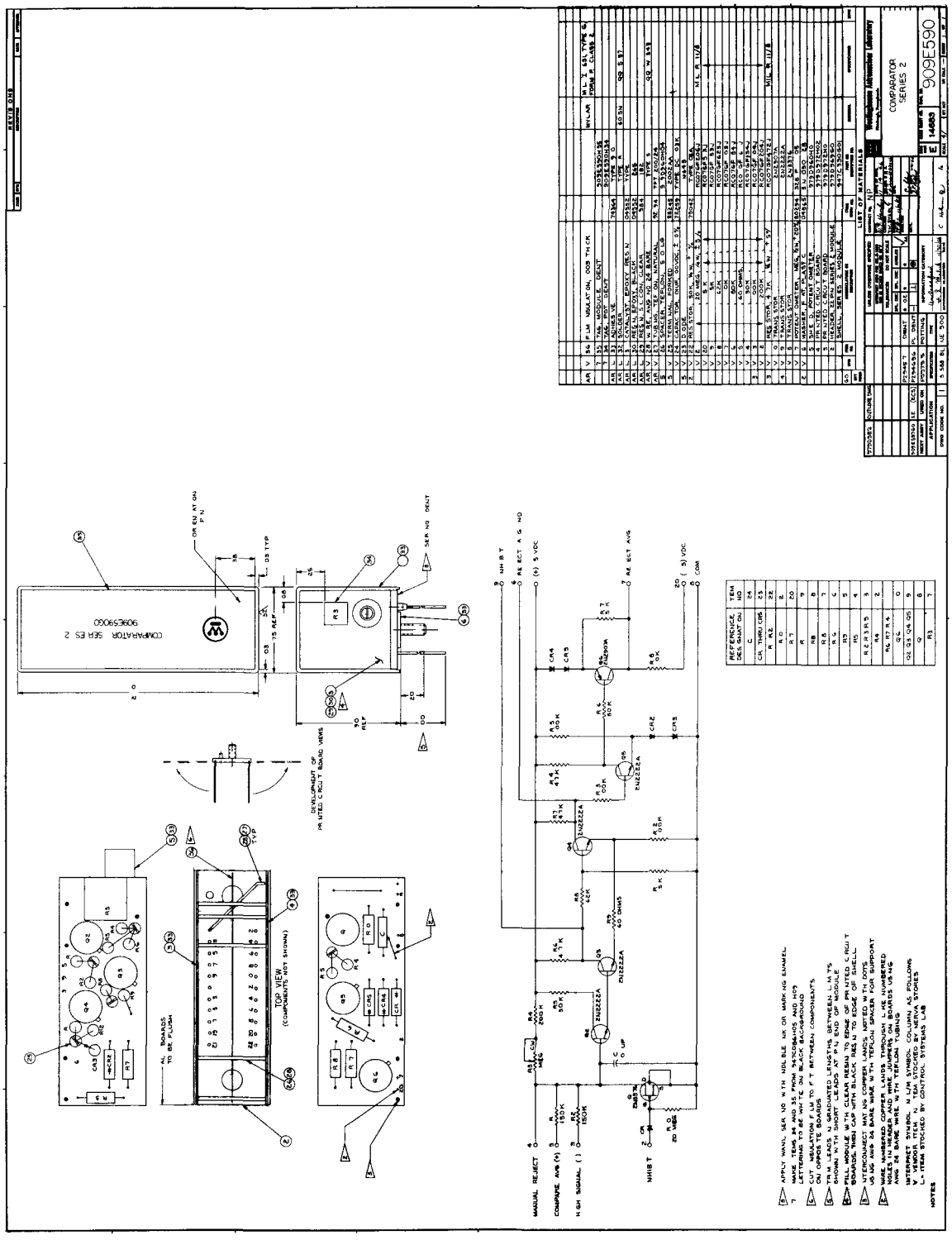


Figure 12

Drawing No. 909E590

Comparator Series 2
Combined Assembly & Schematic

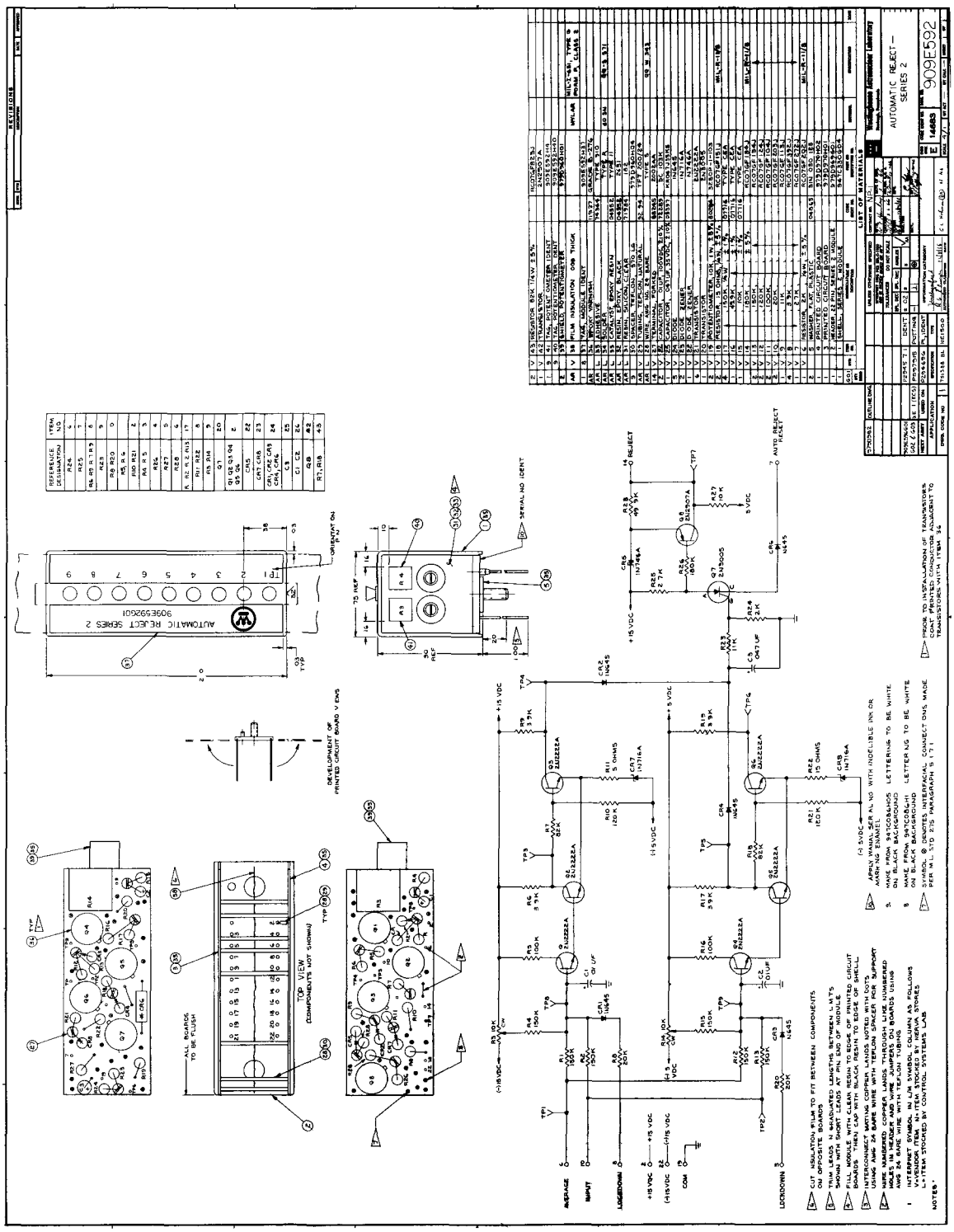


Figure 13

Drawing No. 909E592

Auto Reject Series 2
Combined Assembly & Schematic

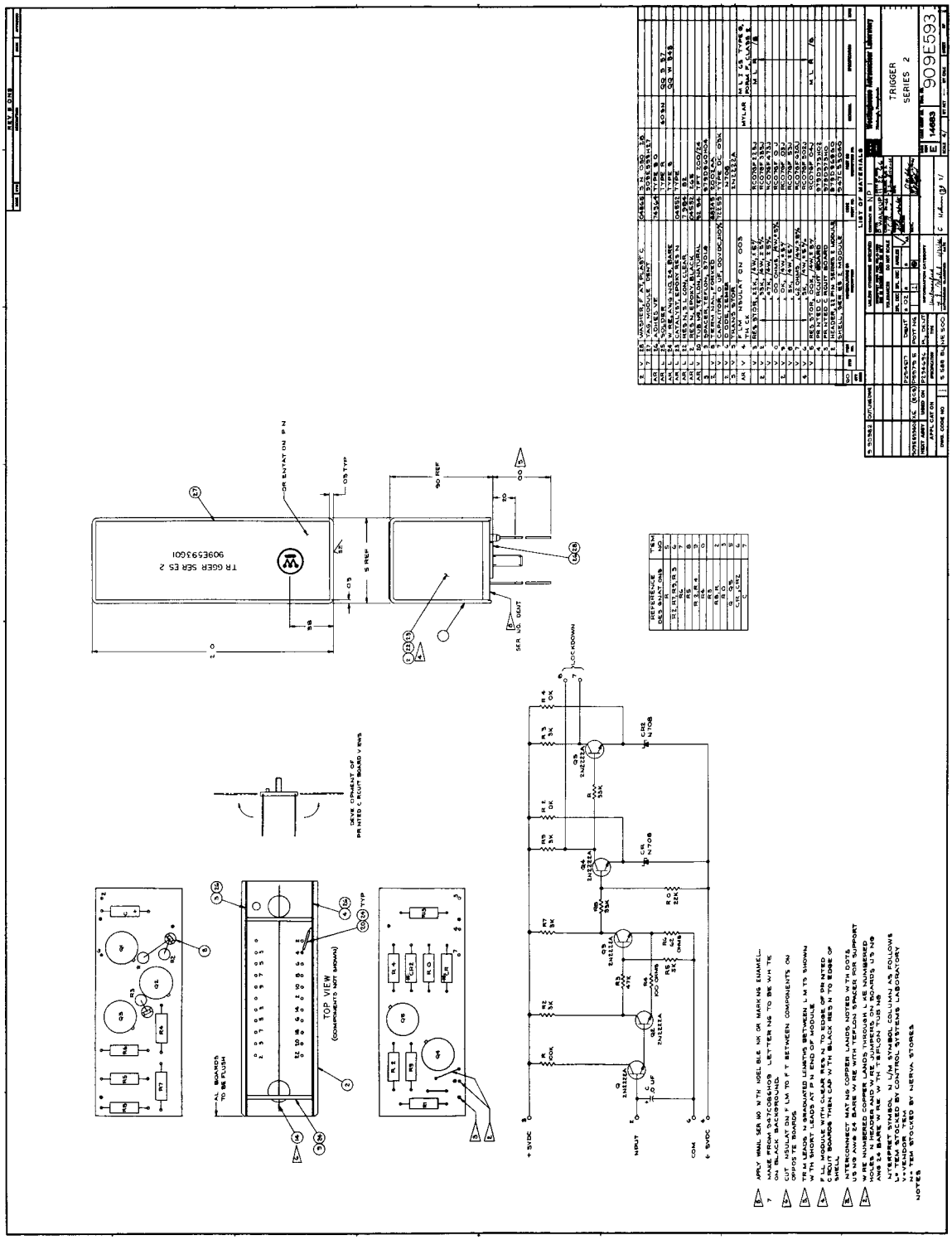


Figure 14

Drawing No. 909E593

Trigger Series 2
Combined Assembly & Schematic

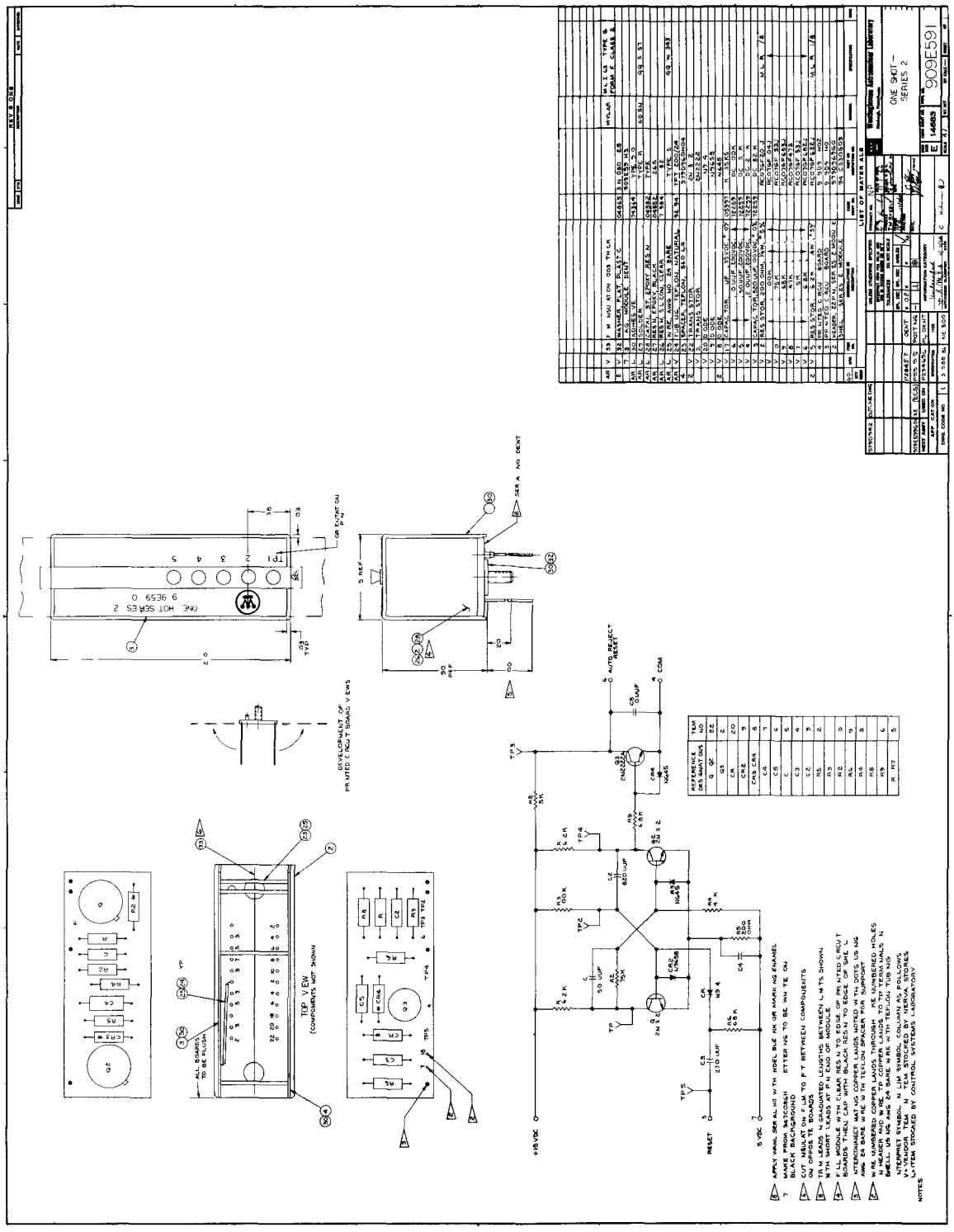


Figure 15

Drawing No. 909E591

One Shot Series 2
Combined Assembly & Schematic

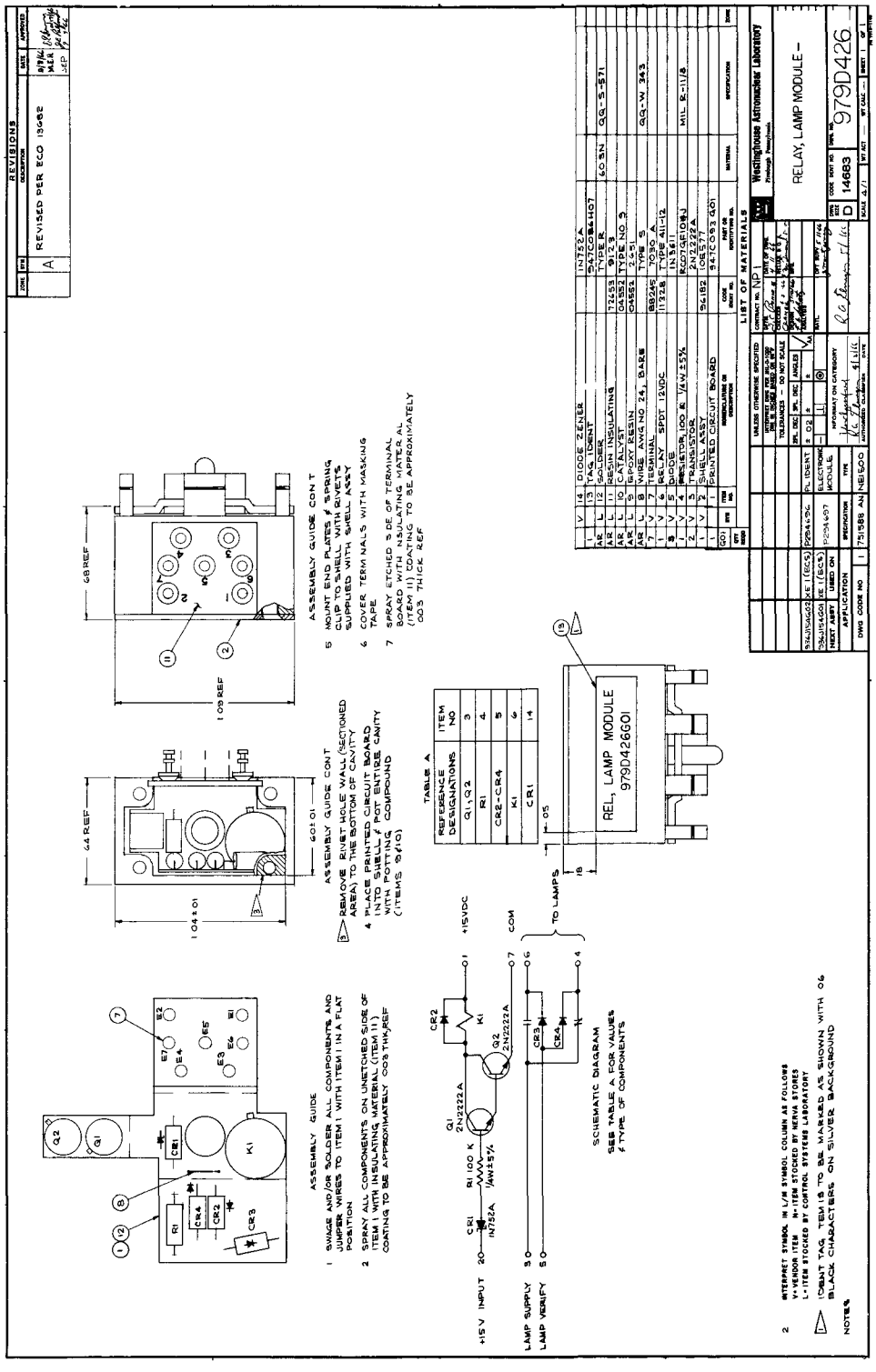


Figure 16

Drawing No. 979D426

Relay, Lamp Module
Combined Assembly & Schematic

TEST SPECIFICATION NUMBER T-711858

ACCEPTANCE TEST SPECIFICATION
XE-1 TEN-CHANNEL AVERAGER

DATE: July 26, 1966

PREPARED BY:

R. A. Schatz Date
Control Systems Engineering
Instrumentation and Control

APPROVED BY:

R. A. Elmiger, Supervisor Date
Equipment Design & Fabrication
Control Systems Engineering
Instrumentation and Control

Quality Engineering Date

REVISION	A
Redesigned Auto Reject and Trigger Modules.	12/21/66

INFORMATION CATEGORY

Unclassified

Authorized Classifier Date 12/21/66

ACCEPTANCE TEST SPECIFICATION AND PROCEDURE

XE-1 TEN CHANNEL AVERAGER

1.0 SCOPE

This document contains the requirements for acceptance testing the XE-1 10 Channel Averager (WANL Drawing 936J154) part of the ETS-1 Test Stand Control System and Engine Control System.

2.0 REQUIREMENTS

2.1 The acceptance tests shall consist of the following:

2.1.1 Visual Examination - To be performed by Quality Control.

2.1.2 Weights and Dimensions - To be performed by Quality Control.

2.1.3 Insulation Resistance - To be performed by Quality Control.

2.1.4 Operational Test (Functional Test) - To be performed by Instrumentation and Control and witnessed by Quality Control.

2.2 The acceptance test shall be performed in the order of and as specified in this procedure. Discrepancies found during the visual examination shall be corrected and re-inspected before performing the functional test. Failure or inability to obtain a required measurement during formal functional testing shall result in establishing a "hold" on the test. The failure or inadequacy shall be recorded by Quality Control and shall be reviewed by

2.2 (Continued)

the WANL Engineering Review Board (ERB). Visual examination shall be performed on the reworked or repaired areas before resuming testing.

3.0 APPLICABLE DOCUMENTS

3.1 Drawing 936J154 - Ten Channel Averager, XE Control System (TSCS)

3.2 Drawing 936J155 - Schematic Diagram, Ten Channel Averager, XE Control System (TSCS/ECS)

3.3 Drawing 936J159 - Wiring Diagram, Ten Channel Averager, XE Control System (TSCS)

3.4 NDC-118A NERVA Design Criteria ETS-1 TSCS (AGC)

4.0 EQUIPMENT REQUIRED

4.1 Multimeter (Simpson 269 or equal)

4.2 Digital Voltmeter (0.1% accuracy)

4.3 ±15VDC Power Supply, Technipower, (2)P-14.5-.100A or equal)

4.4 ±28VDC Power Supply, Technipower, (2)P-28.0-.100A or equal)

4.5 Oscilloscope, Tektronic 502 or equal

4.6 Megohmmeter - General Radio Megger Type 1862-B or equal

4.7 One (1) standard power input cable with connector

4.8 Test Breadboard per Figure 1

4.9 20K 1% 1/2W Resistor

4.10 10K 1% 1/2W Resistor

5.0 ACCEPTANCE TEST PROCEDURE, TEN CHANNEL AVERAGER

5.1 Visual Examination

The equipment under test shall be presented in its final form together with the applicable schematic, wiring diagram, and assembly drawing. The visual examination shall consist of the following parts:

5.1.1 Workmanship, Assembly, and Fit

The inspector shall inspect the equipment for workmanship to WANL requirements, and to assure that the overall chassis is of the proper dimensions per the assembly drawing, Westinghouse Drawing Number 936J154, Rev.

Workmanship OK_____

5.1.2 Materials, Parts, and Finishes

The equipment shall be inspected to assure that the materials, parts, and finishes are in accordance with the applicable assembly drawings. Incoming inspection records on materials, parts, and finishes shall be utilized to determine conformance to the assembly drawings where possible.

Materials OK_____

5.1.3 Treatment for Prevention of Corrosion

The equipment shall be inspected to assure that the coatings for prevention of corrosion have not been impaired during the manufacturing cycle.

5.1.4 Safety Requirements

The equipment shall be inspected to insure that no safety hazard, such as sharp edges, etc., exist on the equipment which are potential hazards to personnel operating or maintaining the equipment.

Safety OK_____

5.1.5 Marking

The markings on the equipment shall be inspected to ensure conformance to the applicable drawings and to assure that they are acceptable as to permanence and readibility.

Marking OK_____

5.1.6 Visual Examination Review

After the visual examination of the equipment has been completed, all deficiencies shall be reviewed by WANL Engineering and Quality Control and corrected by one of the following methods:

a. Drawing changes where drawing deficiencies are noted.

b. Design changes if necessitated.

c. Rework of the parts affected.

5.2 Weights and Dimensions

5.2.1 The unit shall be weighed and the weight shall be recorded.

Weight_____lbs.

5.2.2 The unit shall be measured and the overall dimensions of width, height, and depth recorded.

Width _____ in.

Height _____ in.

Depth _____ in.

5.3 Insulation Resistance

5.3.1 Remove all printed circuit boards. Apply a test voltage of 500VDC between chassis and circuit common with all external leads tied to circuit common, except the chassis ground, Pin E of Connector J1 using a Megger, General Radio 1862-B or equal. The insulation resistance shall be greater than 10 megohms. Reinsert boards.

Insulation Resistance _____ megohms

5.4 Functional System Tests

5.4.1 Insert all P/C cards. Connect power connector J1 which is wired to provide +28V and ±15V. Set "Checkout/Operate" switch (C/O) on test point panel to "Checkout". Checkout on front panel "On" _____. Switch to "Operate" - Operate on front panel "On" _____.

Apply +28V to J4-t and Ret. to J4-u. C/O switch in "Operate" position. "Simulate" lite on front panel "On" _____.

5.4.2 Set up auto reject modules (909E592) to trip at a differential of ±1.00 volts ±0.025 V at Pin 6 and 10. For complete procedure, see Section 1.4 of Test Specification Number 711860 _____.

5.4.3 Set up comparator modules (909E590) to trip when Pin 5 = +9.50 V ±0.005 V; Pin 13 = -7.70 V±0.005 V; and Pin 12 = +15 V.

5.4.4 All P/C cards are qualified per Test Specification Number 711860.

5.4.5 Connect temporary number 24 wires to Pin 19 of A1A1, A1A3, A5A1, A5A3, A9A1, A9A3, A13A1, A13A3, A17A1, and A17A3 and connect to a_9 and a_{10} of test breadboard (see Figure 1). Connect: a_7 to a_5; a_8 to a_6. Set P5 and P6 to zero and connect a_5, a_6 to TP7 _____.

5.4.6 Zero balance all operational amplifiers per Table I using standard test.

TABLE I

TASK	STATION	TEST AMPLIFIER NUMBER	AMPLIFIERS ACCEPTED	COMMENTS
1500 (ECS) -GO1-	1	A1AR1, A1AR2, A2AR1, A4AR1		
	2	A5AR1, A5AR2, A6AR1, A8AR1		
2270 (TSCS) -GO2-	1	A1AR1, A1AR2, A2AR1, A4AR1		
	2	A5AR1, A5AR2, A6AR1, A8AR1		
	3	A9AR1, A9AR2, A10AR1, A12AR1		
	4	A13AR1, A13AR2, A14AR1, A16AR1		
	5	A17AR1, A17AR2, A18AR1, A20AR1		

5.4.7 All front panels are lit by depressing "Lamp Verify" switch_____.

5.4.8 The "Automatic Channel Reject Limit" switches on the front panel have mechanical stops set as indicated in Table IA.

TABLE IA

TASK	STATION	MAXIMUM CCW POSITION	MAXIMUM CW POSITION	TOTAL OF DETENTED POSITIONS	SWITCHES ACCEPTED
	1	0	6	7	
1500	2	0	6	7	
(ECS)	3	0	6	7	
-GO1-	4	0	6	7	
	5	0	6	7	
	1	0	3	4	
2270	2	0	3	4	
(TSCS)	3	0	3	4	
-GO2-	4	0	2	3	
	5	0	2	3	

5.4.9 Initial Conditions. Switch chassis into "checkout" and connect as shown in Table II-A.

TABLE II-A

	Station	Connect α_2 to	Connect 10K Resistor From TP7 to	Set P_2 to	Set Channel Reject Limit to
ECS	1	TP10, 11, 12... 18, 19	TP1	-8.00V±.010V	6
	2	TP20, 21, 22... 28, 29	TP2	" "	6
	3	TP30, 31, 32... 38, 39	TP3	" "	6
	4	TP40, 41, 42... 48, 49	TP4	" "	6
	5	TP50, 51, 52... 58, 59	TP5	" "	6
TSCS	1	TP10, 11, 12, 13, 14, 15	TP1	" "	3
	2	TP20, 21, 22, 23, 24, 25	TP2	" "	3
	3	TP30, 31, 32, 33, 34, 35	TP3	" "	3
	4	TP40, 41, 42, 43	TP4	" "	2
	5	TP50, 51, 52, 53	TP5	" "	2

Verify initial conditions by completing Table II_____. Adjust Pot R3 and R8 (909E598) such as to minimize absolute error between P_2 voltage and voltage measured at TP1, TP2, TP3, TP4, TP5, for ECS and TSCS Chassis.

5.4.10 Verify operational routine of ECS Averager by completing Table III_____.

5.4.11 Verify operational routine of TSCS Averager by completing Table IV_____.

5.4.12 Verify Manual Reject Patch capability of ECS Averager by completing Table V_____.

5.4.13 Verify Manual Reject Patch capability of TSCS Averager by completing Table VI_____.

5.4.14 Power Check

5.4.14.1 With power connector J1 inserted, all fuse lites are "Off" with fuses in place_____. Remove all fuses and reinsert fuse assembly. All fuse lites "On".

5.4.14.2 Connect DVM to TP6, 7. DVM reads +15.0V±.005V _____.

Connect DVM to TP8, 7. DVM reads -15.0V±.005V _____.

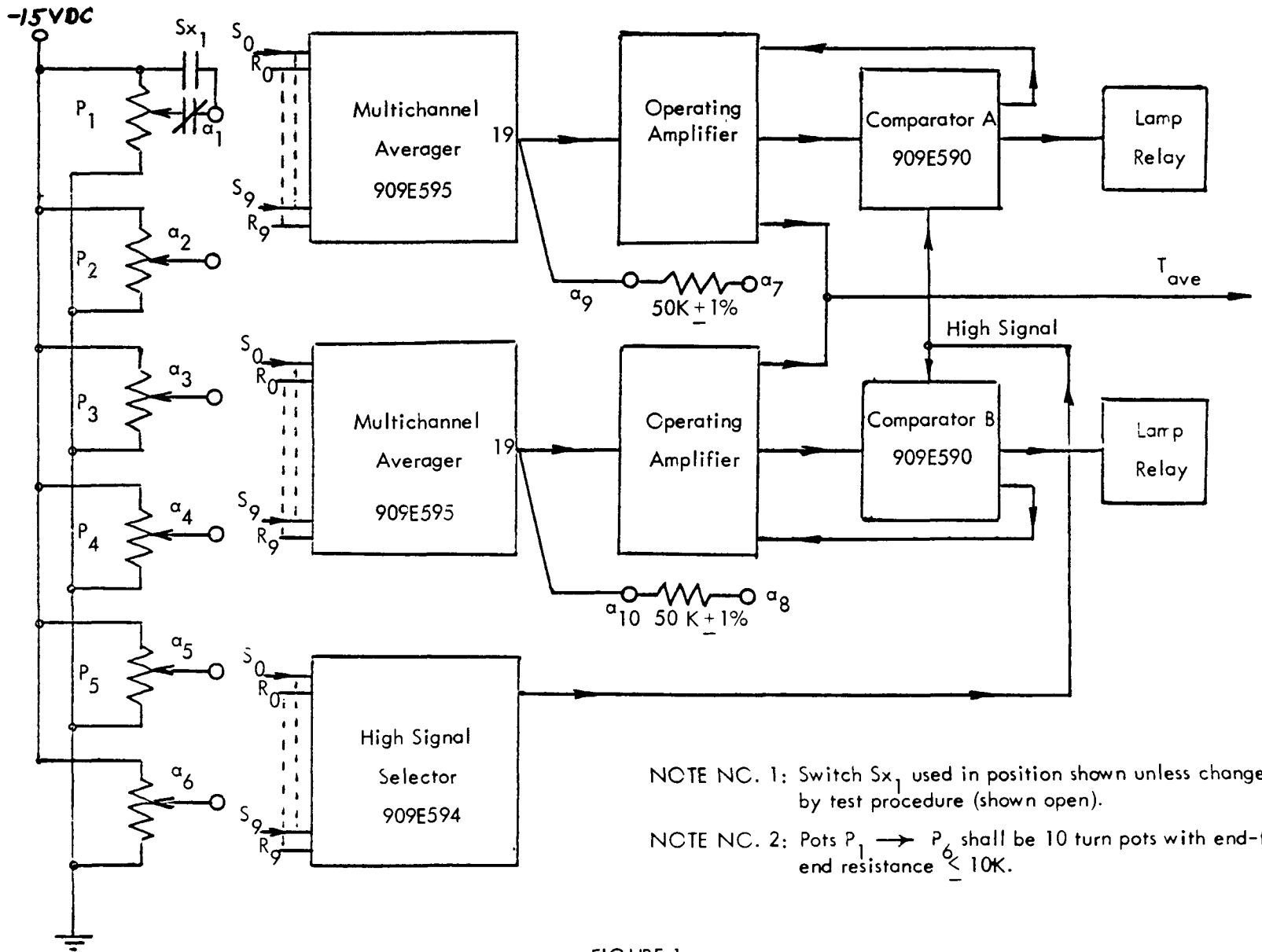
Connect DVM to TP9, 60. DVM reads +28.0V±.050V _____.

5.4.15 Safety Ground

5.4.15.1 Connect MM (on lowest ohmic scale) to J1-E and bare chassis. MM reads 0.0 ohms_____.

5.4.16 Continuity Check

5.4.16.1 Connect MM between the points listed in Table VII and test as indicated.



NOTE NC. 1: Switch Sx_1 used in position shown unless changed by test procedure (shown open).

NOTE NC. 2: Pots $P_1 \rightarrow P_6 \leq$ 10K.

FIGURE 1

Astronuclear Laboratory
WANL-TME-1461

TABLE II - ECS (G01)

STATION NO. 1			STATION NO. 2			STATION NO. 3			STATION NO. 4			STATION NO. 5		
Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value
TP1	+8.00V		TP2	+8.00V		TP3	+8.0V		TP4	+8.00V		TP5	+8.00V	
A4TP2	<+0.20V		A8TP2	<+0.20V		A12TP2	<+0.20V		A16TP2	<+0.20V		A20TP2	<+0.20V	
A4TP1	-4.00V		A8TP1	-4.00V		A12TP1	-4.0V		A16TP1	-4.00V		A20TP1	-4.00V	
A4TP3	>+7.5V		A8TP3	>+7.5V		A12TP3	>+7.5V		A16TP3	>+7.5V		A20TP3	>+7.5V	
A4TP4	<-7.5V		A8TP4	<-7.5V		A12TP4	<-7.5V		A16TP4	<-7.5V		A20TP4	<-7.5V	
J5-E	+8.00V		J5-R	+8.00V		J5-b	+8.00V		J5-m	+8.00V		J5-x	+8.00V	
A3A1TP7	<-10.0V		A7A1TP7	<-10.0V		A11A1TP7	<-10.0V		A15A1TP7	<-10.0V		A19A1TP7	<-10.0V	
A3A2TP7	<-10.0V		A7A2TP7	<-10.0V		A11A2TP7	<-10.0V		A15A2TP7	<-10.0V		A19A2TP7	<-10.0V	
A3A3TP7	<-10.0V		A7A3TP7	<-10.0V		A11A3TP7	<-10.0V		A15A3TP7	<-10.0V		A19A3TP7	<-10.0V	
A3A4TP7	<-10.0V		A7A4TP7	<-10.0V		A11A4TP7	<-10.0V		A15A4TP7	<-10.0V		A19A4TP7	<-10.0V	
A3A5TP7	<-10.0V		A7A5TP7	<-10.0V		A11A5TP7	<-10.0V		A15A5TP7	<-10.0V		A19A5TP7	<-10.0V	
A3A6TP7	<-10.0V		A7A6TP7	<-10.0V		A11A6TP7	<-10.0V		A15A6TP7	<-10.0V		A19A6TP7	<-10.0V	
A3A7TP7	<-10.0V		A7A7TP7	<-10.0V		A11A7TP7	<-10.0V		A15A7TP7	<-10.0V		A19A7TP7	<-10.0V	
A3A8TP7	<-10.0V		A7A8TP7	<-10.0V		A11A8TP7	<-10.0V		A15A8TP7	<-10.0V		A19A8TP7	<-10.0V	
A3A9TP7	<-10.0V		A7A9TP7	<-10.0V		A11A9TP7	<-10.0V		A15A9TP7	<-10.0V		A19A9TP7	<-10.0V	
A3A10TP7	<-10.0V		A7A10TP7	<-10.0V		A11A10TP7	<-10.0V		A15A10TP7	<-10.0V		A19A10TP7	<-10.0V	
Front Panel	Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"	

TABLE II - ECS (G01) Continued

STATION NO. 1			STATION NO. 2			STATION NO. 3			STATION NO. 4			STATION NO. 5		
Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value
J6-18	<-8.0V		J10-18	<-8.0V		J14-18	<-8.0V		J18-18	<-8.0V		J22-18	<-8.0V	
J6-34	<-8.0V		J10-34	<-8.0V		J14-34	<-8.0V		J18-34	<-8.0V		J22-34	<-8.0V	
J7-9	<+0.60V		J11-9	<+0.60V		J15-9	<+0.60V		J19-9	<+0.60V		J23-9	<+0.60V	
J7-10	<+0.60V		J11-10	<+0.60V		J15-10	<+0.60V		J19-10	<+0.60V		J23-10	<+0.60V	
Front Panel	Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"	

TABLE II - TSCS (G02)

STATION NO. 1			STATION NO. 2			STATION NO. 3			STATION NO. 4			STATION NO. 5		
Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value	Test Location	Calx. Value ±40mv	Meas. Value
TP1	+8.00V		TP2	+8.00V		TP3	+8.00V		TP4	+8.00V		TP5	+8.00V	
A4TP2	<+0.20V		A8TP2	<+0.20V		A12TP2	<+0.20V		A16TP2	<+0.20V		A20TP2	<+0.20V	
A4TP1	-4.00V		A8TP1	-4.00V		A12TP1	-4.00V		A16TP1	-4.00V		A20TP1	-4.00V	
A4TP3	>+7.5V		A8TP3	>+7.5V		A12TP3	>+7.5V		A16TP3	>+7.5V		A20TP3	>+7.5V	
A4TP4	<-7.5V		A8TP4	<-7.5V		A12TP4	<-7.5V		A16TP4	<-7.5V		A20TP4	<-7.5V	
J5-E	+8.00V		J5-R	+8.00V		J5-b	+8.00V		J5-m	+8.00V		J5-x	+8.00V	
A3A1TP7	<-10.0V		A7A1TP7	<-10.0V		A11A1TP7	<-10.0V		A15A1TP7	<-10.0V		A19A1TP7	<-10.0V	
A3A2TP7	<-10.0V		A7A2TP7	<-10.0V		A11A2TP7	<-10.0V		A15A2TP7	<-10.0V		A19A2TP7	<-10.0V	
A3A3TP7	<-10.0V		A7A3TP7	<-10.0V		A11A3TP7	<-10.0V		A15A3TP7	<-10.0V		A19A3TP7	<-10.0V	
A3A4TP7	<-10.0V		A7A4TP7	<-10.0V		A11A4TP7	<-10.0V		A15A4TP7	<-10.0V		A19A4TP7	<-10.0V	
A3A5TP7	<-10.0V		A7A5TP7	<-10.0V		A11A5TP7	<-10.0V		J18-18	<-10.0V		J22-18	<-8.0V	
A3A6TP7	<-10.0V		A7A6TP7	<-10.0V		A11A6TP7	<-10.0V		J18-34	<-10.0V		J22-34	<-8.0V	
J6-18	<-8.0V		J10-18	<-8.0V		J14-18	<-8.0V		J19-9	<+0.60V		J23-9	<+0.60V	
J6-34	<-8.0V		J10-34	<-8.0V		J14-34	<-8.0V		J19-10	<+0.60V		J23-10	<+0.60V	
J7-9	<+0.60V		J11-9	<+0.60V		J15-9	<+0.60V							
J7-10	<+0.60V		J11-10	<+0.60V		J15-10	<+0.60V							
Front Panel	Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"			Reject A, B, and Lockdown Lights "Off"	

TABLE III - ECS (301)

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1															
Connect: α_1 to TP10, α_2 to TP11, α_3 to TP12,	A3A1	>+10V		A3A2	<-10V		A3A3	<-10V		A3A4	<-10V		A3A5	<-10V	
α_4 to TP13, 14 ... 19. Set P_1, P_2, P_3, P_4 to	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
-5.00V±0.002V. Set Reject Limit Switch to "3".	A3A6	<-10V		A3A7	<-10V		A3A8	<-10V		A3A9	<-10V		A3A10	<-10V	
Reset. Increase P_1 to -6.11V±0.020V.	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	TP1	+5.0V		A4	-5.0V		A4	>+7.5V		A4	<-7.5V		J5-	+5.0V	
	--	--		TP1	--		TP3	--		TP4	--		E	--	
Increase P_2 to -6.13V±.020V	A3A1	>+10V		A3A2	>+10V		A3A3	<-10V		A3A4	<-10V		A3A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A3A6	<-10V		A3A7	<-10V		A3A8	<-10V		A3A9	<-10V		A3A10	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	TP1	+5.0V		A4	-6.0V		A4	>+7.5V		A4	<-7.5V				
	--	--		TP1	--		TP3	--		TP4	--				
Increase P_3 to -6.15V±0.020V	A3A1	>+10V		A3A2	>+10V		A3A3	>+10V		A3A4	<-10V		A3A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A3A6	<-10V		A3A7	<-10V		A3A8	<-10V		A3A9	<-10V		A3A10	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	TP1	+5.0V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light	"On"	

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Connect: TP_{13} to α_1, TP_{14} to α_2	TP1	+5.0V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
Set P_1, P_2 to -5.0V±0.002V	--	--		TP1	--		TP3	--		TP4	--		Light	"On"	
Set P_1 to -10.00V±.002V	TP1	+5.428		A3A1	>+10V		A3A2	>+10V		A3A3	>+10V		A3A4	<-10V	
Set P_2 to -3.00V±.002V	--			TP7	--		TP7	--		TP7	--		TP7	--	
	A3A5	<-10V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light	"On"	
Using "Manual Reject" Patch on Test Point Panel,	TP1	+5.0V		A3A1	>+10V		A3A2	>+10V		A3A3	>+10V		A3A4	>+10V	
Patch out Channels Numbers 3, 4, and 5	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A3A5	>+10V		A4	-10.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light	"On"	
Connect: α_1 to TP_{10}, α_2 to TP_{11}, α_3 to TP_{12},	TP1	+5.0V		A4	-4.0V		A4	>+7.5V		A4	<-7.5V				
α_4 to TP_{13}, $_{14\cdots 19}$. Remove "Manual Reject" patch pins. Set P_1, P_2, P_3, P_4 to -5.00V±.002V. Reject Limit Switch set to "3". Reset.	--	--		TP1	--		TP3	--		TP4	--				
Set P_1, P_2, P_3 to -3.0V±.002V	TP1	+5.0V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light	"On"	

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Reset	TP1	+5.0V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1, P_2, P_3 to -5.0V±.002V	TP1	+5.0V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset	TP1	+5.0V		A4	-4.0V		A4	>+7.5V		A4	<-7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "Off"		
Set P_6 to zero. Remove ground from P_6 to TP7.	TP1	+8.0V		A4	-4.0V		J6	<-8V		J6-	<-8V		J6-	<+9.0V	
Set P_1, P_2, P_3, P_4 = -8.0V±0.002V.	--	--		TP1	--		-18	--		34			4	--	
Reset.	J6-	<+9.0V													
	35	--													
Increase P_6 to -1.00V±0.020V	TP1	+8.0V		A4	-4.0V		J6-	<-8V		J6-	>+10V		J6	<+9.0V	
	--	--		TP1	--		18	--		34	--		4	--	
	J6-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5 to zero. Remove ground from P_5 to TP7	TP1	+8.25V		A4	-4.0V		J6-	<-8V		J6-	>+10V		J6	<+9.2V	
Set P_5 to -0.30V±.002V	--	--		TP1	--		18	--		34	--		4	--	
	J6-	>+11V		"B Reject"											
	35	--		Light "On"											

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ± 020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Set P_5, P_6 to zero.	TP1	+8.0V		A4	-4.0V		J6	<-8 V		J6-	<-8V		J6-	<+9.0V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J6-	<+9.0V		"B Reject"											
	35	--		Light	"Off"										
Set P_5 to -1.00V±.020V	TP1	+8.0V		A4	-4.0V		J6-	>+10V		J6-	<-8V		J6-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J6-	<+9.0V		"A Reject"											
	35	--		Light	"On"										
Set P_6 to -0.30V±.002V	TP1	+8.25V		A4	-4.0V		J6-	>+10V		J6-	<-8V		J6-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J6-	<+9.2V		"A Reject"											
	35	--		Light	"On"										
Set P_5, P_6 to zero	TP1	+8.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V		J6-	<+9.0V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J6-	<+9.0V		"A Reject"											
	35	--		Light	"Off"										

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Connect: α_8 to TP7; α_7 to α_1; TP10, 11...19 to α_2. Set P_1 to zero and P_2 to -5.00V±0.002V. Reset. Connect oscilloscope to TP1, 7. Set to trigger on (+) slope.	TP1	+5.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V				
	--	--		TP1	--		18	--		34	--				
Close Switch S_{X1}	Transient DC voltage at TP1, 7 will rise to <+6.00V and then decay to +5.0V±0.020V in <500μ seconds _____. "A" reject light "On" _____.														
Connect: α_7 to TP7; α_8 to α_1; TP10, 11....19 to α_2. Open S_{X1}. Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP1, 7. Set to trigger on (+) slope.	TP1	+5.0V		A4	-4.0V		J6-	<-8V		J6-	<-10V				
	--	--		TP1	--		18	--		34	--				
Close S_{X1}	Transient DC voltage at TP1, 7 will rise to <+6.00V and then decay to +5.0V±0.020V in <500μ seconds _____. "B" reject light "On" _____.														
Connect: α_7, α_8, to TP7; TP10 to α_1; TP11, 12,...19 to α_2. Open S_{X1}. Set P_1, P_2 to -5.0V ±.002V. Connect oscilloscope to TP1, 7. Set to trigger on (+) slope.	TP1	+5.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V				
	--	--		TP1	--		18	--		34	--				

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued															
Close S_{X1}	Transient DC voltage at TP1, 7 will rise to <+6.00V and then decay to +5.0V±0.020V in <500μ seconds.														
Connect: α_7, α_8 to TP7; TP10 to α_1; TP11 to α_2; TP12 to α_3; TP13 to α_4; TP14 to α_5; TP15, 16, 17, 18, 19 to α_6. Open S_{X1}. Set P_1, P_2, P_3, P_4, P_5, P_6 to -5.0V±.002V. Set reject limit switch to "6". Reset.	TP1	+5.0V		A4	-4.0V										
	--	--		TP1	--										
Set P_1 to 0.0V	TP1	+5.0V		A4	-5.0V		A4	>+7.5V							
	--	--		TP1	--		TP3	--							
Set P_2 to 0.0V	TP1	+5.0V		A4	-6.0V		A4	>+7.5V							
	--	--		TP1	--		TP3	--							
Set P_3 to 0.0V	TP1	+5.0V		A4	-7.0V		A6	>+7.5V							
	--	--		TP1	--		TP3	--							
Set P_4 to 0.0V	TP1	+5.0V		A4	-8.0V		A4	>+7.5V							
	--	--		TP1	--		TP3	--							

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Set P_5 to 0.0V	TP1	+5.0V		A4	-9.0V		A4	>+7.5V							
	--	--		TP1	--		TP3	--							
Connect oscilloscope to TP1, 7. Set trigger on (-) slope. Reset.	Transient DC voltage at TP1, 7 will drop to >+2.50V and then rise to +5.0V±0.020V in <200μ seconds.												A4	-9.0V	
													TP1	--	
STATION NO. 2															
Connect: α_1 to TP20; α_2 to TP21; α_3 to TP22;	A7A1	>+10V		A7A2	<-10V		A7A3	<-10V		A7A4	<-10V		A7A5	<-10V	
α_4 to TP23, 24...29. Set P_1, P_2, P_3, P_4 to	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
-5.0V±.002V. Set Reject Limit Switch to "3".	A7A6	<-10V		A7A7	<-10V		A7A8	<-10V		A7A9	<-10V		A7A10	<-10V	
Reset. Increase P_1 to -6.11V±0.020V.	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	TP2	+5.0V		A8	-5.0V		A8	>+7.5V		A8	<-7.5V		J5-	+5.0V	
	--	--		TP1	--		TP3	--		TP4	--		R	--	
Increase P_2 to -6.13V±0.020V	A7A1	>+10V		A7A2	>+10V		A7A3	<-10V		A7A4	<-10V		A7A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A6	<-10V		A7A7	<-10V		A7A8	<-10V		A7A9	<-10V		A7A10	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
	TP2	+5.0V		A8	-6.0V		A8	>+7.5V		A8	<-7.5V				
	--	--		TP1	--		TP3	--		TP4	--				
Increase P_3 to -6.15V±.020V	A7A1	>+10V		A7A2	>+10V		A7A3	>+10V		A7A4	<-10V		A7A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A6	<-10V		A7A7	<-10V		A7A8	<-10V		A7A9	<-10V		A7A10	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	TP2	+5.0V		A8	-7.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Connect: TP23 to σ_1, TP24 to σ_2. Set P_1, P_2 to -5.0V±0.002V	TP2	+5.0V		A8	-7.0V		A8	<-7.5V		A8	>+7.50V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1 to -10.0V±.020V	TP2	+5.428		A7A1	>+10V		A7A2	>+10V		A7A3	>+10V		A7A4	<-10V	
Set P_2 to -3.0V±.020V	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A5	<-10V		A8	-7.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light "On"		

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
Use "Manual Reject" patch on test point panel.	TP2	+5.0V		A7A1	>+10V		A7A2	>+10V		A7A3	>+10V		A7A4	>+10V	
Patch out Channels Nos. 3, 4, and 5.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A5	>+10V		A8	-10V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light "On"		
Connect: α_1 to TP20; α_2 to TP21; α_3 to TP22;	TP2	+5.0V		A8	-4.0V		A8	>+7.5V		A8	<-7.5V				
α_4 to TP23, 24...29. Remove "Manual Reject"	--	--		TP1	--		TP3	--		TP4	--				
patch pins. Set P_1, P_2, P_3, P_4 to -5.0V±.002V.															
Reject Limit Switch set to "3". Reset.															
Set P_1, P_2, P_3 to -3.0V±.002V	TP2	+5.0V		A8	-7.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset	TP2	+5.0V		A8	-7.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
				TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1, P_2, P_3 to -5.0V±.002V	TP2	+5.0V		A8	-7.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset	TP2	+5.0V		A8	-4.0V		A8	>+7.5V		A8	<-7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "Off"		

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TABLE III - ECS (301) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Set P_6 to zero. Remove ground from α_6 to TP7.	TP2	+8.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V		J10	<+9V	
Set P_1, P_2, P_3, P_4 = -8.0V±.002V. Reset.	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+9V													
	35	--													
Increase P_6 to -1.0V±.020V	TP2	+8.0V		A8	-4.0V		J10-	<-8V		J10-	>+10V		J10-	<+9V	
	--	--		TP1	--		18	--		34	--		4	--	
	J10	>+11V		"B Reject											
	35	--		Light "On"											
Set P_5 to zero. Remove ground from α_5 to TP7.	TP2	+8.25V		A8	-4.0V		J10-	<-8V		J10-	>+10V		J10-	<+9.2V	
Set P_5 to -.30V ±.002V	--	--		TP1	--		18	--		34	--		4	--	
	J10-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP2	+8.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V		J10-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+9.0V		"B Reject"											
	35	--		Light "Off"											

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Set P_5 to -1.00V±.020V	TP2	+8.0V		A8	-4.0V		J10-	>+10V		J10-	<-8V		J10	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+9.0V		"A Reject"											
	35	--		Light "On"											
Set P_6 to -.30V ±.002V	TP2	+8.25V		A8	-4.0V		J10-	>+10V		J10-	<-8V		J10-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+9V		"A Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP2	+8.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V		J10-	<+9.0V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+9.0V		"A Reject"											
	35	--		Light "Off"											
Connect: α_8 to TP7; α_7 to α_1; TP20, 21...29 to α_2. Set P_1 to zero and P_2 to -5.00V±0.020V. Reset. Connect oscilloscope to TP2, 7. Set to trigger on (+) slope.	TP2	+5.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V				
	--	--		TP1	--		18	--		34	--				

TABLE III - ECS (301) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Close Switch S_{X1}.	Transient DC voltage at TP2, 7 will rise to <+6.00V and then decay to +5.0V±0.020V in < 500μ seconds _____. "A Reject" Light "On"_____.														
Connect: α_7 to TP7; α_8 to α_1; TP20, 21... 29 to α_2. Open S_{X1}. Set P_1 to zero and P_2 to -5.0V±0.002V. Reset. Connect oscilloscope to TP2, 7. Set to trigger on (+) slope.	TP2 --	+5.0V --		A8 TP1	-4.0V --		J10- 18	<-8V --		J10- 34	<-8V --				
Close S_{X1}.	Transient DC voltage at TP2, 7 will rise to +6.00V and then decay to +5.0V±0.02V in <500μ seconds _____. "B Reject" Light "On"_____.														
Connect: α_7, α_8, to TP7; TP20 to α_1, TP21, 22, ...29 to α_2. Open S_{X1}. Set P_1, P_2 to -5.0V±.002V. Connect oscilloscope to TP2, 7. Set to trigger on (+) slope.	TP2 --	+5.0V --		A8 TP1	-4.0V --		J10- 18	<-8V --		J10- 34	<-8V --				
Close S_{X1}.	Transient DC voltage at TP2, 7 will rise to <+6.00V and then decay to +5.0V±0.020V in <500μ seconds _____.														

TABLE III - ECS (G01) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Connect: α_7, α_8 to TP7; TP20 to α_1; TP21 to α_2; TP22 to α_3; TP23 to α_4; TP24 to α_5; TP25, 26, 27, 28, 29 to α_6. Open S_{X1}. Set P_1, P_2, P_3, P_4, P_5, P_6 to -5.0V±.002V. Set Reject Limit Switch to "6". Reset.	TP2	+5.0V		A8	-4.0V									
	--	--		TP1	--									
Set P_1 to 0.0V	TP2	+5.0V		A8	-5.0V		A8	>+7.5V						
	--	--		TP1	--		TP3	--						
Set P_2 to 0.0V	TP2	+5.0V		A8	-6.0V		A8	>+7.5V						
	--	--		TP1	--		TP3	--						
Set P_3 to 0.0V	TP2	+5.0V		A8	-7.0V		A8	>+7.5V						
	--	--		TP1	--		TP3	--						
Set P_4 to 0.0V	TP2	+5.0V		A8	-8.0V		A8	>+7.5V						
	--	--		TP1	--		TP3	--						
Set P_5 to 0.0V	TP2	+5.0V		A8	-9.0V		A8	>+7.5V						
	--	--		TP1	--		TP3	--						
Connect oscilloscope to TP2, 7. Set trigger on (-) slope. Reset.	Transient DC voltage at TP2, 7 will drop to >+2.50V and then rise to +5.0V±0.020V in <200μ seconds														

TABLE IV - TSCS (G02)

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1															
Connect: α_1 to TP10; α_2 to TP11; α_3 to TP12;	A3A1	>+10V		A3A2	<-10V		A3A3	<-10V		A3A4	<-10V		A3A5	<-10V	
α_4 to TP13, 14, 15. Set P_1, P_2, P_3, P_4 to	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
-5.0V±.002V. Set Reject Limit Switch to "3".	A3A6	<-10V		TP1	+5.0V		A4	-5.0V		A4	>+7.5V		A4	<-7.5V	
Reset. Increase P_1 to -6.20V±.020V.	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
	J5-E	+5.0V													
Increase P_2 to -6.25V±.020V	A3A1	>+10V		A3A2	>+10V		A3A3	<-10V		A3A4	<-10V		A3A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A3A6	<-10V		TP1	+5.0V		A4	-6.0V		A4	>+7.5V		A4	<-7.5V	
	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
Increase P_3 to -6.34V±.020V	A3A1	>+10V		A3A2	>+10V		A3A3	>+10V		A3A4	<-10V		A3A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A3A6	<-10V		TP1	+5.0V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V	
	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
	Lockdown Light "On"														

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ± 020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Connect: TP13 to α_1; TP14 to α_2. Set P_1, P_2	TP1	+5.0V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
to -5.0V±.002V.	--	--		TP1	--		TP3	--		TP4	--		Light	"On"	
Set P_1 to -10.0V±.002V	TP1	+6.0V		A3A1	>+10V		A3A2	>+10V		A3A3	>+10V		A3A4	<-10V	
Set P_2 to -3.0V±.002V.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A3A5	<-10V		A4	-7.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light	"On"	
Using "Manual Reject" patch on Test Point Panel,	TP1	+4.0V		A3A1	>+10V		A3A2	>+10V		A3A3	>+10V		A3A4	>+10V	
Patch out Channel No. 3.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A3A5	<-10V		A4	-8.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light	"On"	
Connect: α_1 to TP10; α_2 to TP11; α_3 to TP12;	TP1	+5.0V		A4	-4.0V		A4	>+7.5V		A4	<-7.5V				
α_4 to TP13, 14, 15. Remove "Manual Reject"	--	--		TP1	--		TP3	--		TP4	--				
patch pin. Set P_1, P_2, P_3, P_4 to -5.0V±.002V.															
Reject Limit Switch set to "2". Reset.															
Set P_1, P_2 to -3.0V±.002V.	TP1	+5.0V		A4	-6.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light	"On"	
Reset	TP1	+5.0V		A4	-6.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light	"On"	

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Set P_1, P_2, P_3 to -5.0V±.002V	TP1	+5.0V		A4	-6.0V		A4	<-7.5V		A4	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset	TP1	+5.0V		A4	-4.0V		A4	>+7.5V		A4	<-7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "Off"		
Set P_6 to zero. Remove ground from α_6 to TP-7.	TP1	+8.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V		J6-	<+9.0V	
Set P_1, P_2, P_3, P_4 to -8.0V±.002V. Reset.	--	--		TP1	--		18	--		34	--		4	--	
	J6-	<+9V													
	35	--													
Increase P_6 to -1.0V±.020V	TP1	+8.0V		A4	-4.0V		J6-	<-8V		J6-	>+10V		J6-	<+9V	
	--	--		TP1	--		18	--		34	--		4	--	
	J6-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5 to zero. Remove ground from α_5 to TP7.	TP1	+8.83V		A4	-4.0V		J6-	<-8V		J6-	>+10V		J6-	<+10V	
Set P_5 to -0.5V ±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J6-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP1	+8.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V		J6-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
	J6-	< +9V		"B Reject"											
	35	--		Light "Off"											
Set P_5 to -1.0V ±.020V.	TP1	+8.0V		A4	-4.0V		J6-	> +10V		J6-	< -8V		J6-	> +11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J6-	< +9V		"A Reject"											
	35	--		Light "On"											
Set P_6 to -0.5V ±.002V.	TP1	+8.83V		A4	-4.0V		J6-	> +10V		J6-	< -8V		J6-	> +11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J6-	< +10V		"A Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP1	+8.0V		A4	-4.0V		J6-	< -8V		J6-	< -8V		J6-	< +9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J6-	< +9V		"A Reject"											
	35	--		Light "Off"											

TABLE IV- TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Connect: α_8 to TP7; α_7 to α_1; TP13, 11, ...	TP1	+5.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V				
15 to α_2. Set P_1 to zero and P_2 to -5.00V±.002	--	--		TP1	--		18	--		34	--				
V. Reset. Connect oscilloscope to TP1, 7. Set to trigger on (+) slope.															
Close S_{X1}.	Transient DC voltage at TP1, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds														
	_____. "A Reject" Light "On".														
Connect: α_7 to TP7; α_8 to α_1; TP10, 11, ...	TP1	+5.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V				
15 to α_2. Open S_{X1}. Set P_1 to zero and P_2 to	--	--		TP1	--		18	--		34	--				
-5.0V±.002V. Reset. Connect oscilloscope to TP1, 7. Set to trigger on (+) slope.															
Close S_{X1}.	Transient DC voltage at TP1, 7 will rise to <+6.0V and then decay to +5.0V±0.020V in <500μ seconds														
	_____. "B Reject" Light "On" _____.														
Connect: α_7, α_8 to TP7; TP10 to α_1; TP11, 12, ...	TP1	+5.0V		A4	-4.0V		J6-	<-8V		J6-	<-8V				
15 to α_2. Open S_{X1}. Set P_1, P_2 to -5.0V±.002V	--	--		TP1	--		18	--		34	--				
Connect oscilloscope to TP1, 7. Set to trigger on (+) slope.															

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 1 (Continued)															
Close S_{X1}.	Transient DC voltage at TP1, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____.														
Connect: α_7, α_8 to TP7; TP10 to α_1, TP11 to α_2; TP12 to α_3; TP13, 14, 15 to α_4. Open S_{X1}. Set P_1, P_2, P_3, P_4 to -5.0V±.002V. Set Reject Limit Switch to "2". Reset.	TP1	+5.0V		A4	-4.0V										
	--	--		TP1	--										
Set P_1 to 0.0V.	TP1	+5.0V		A4	-5.0V		A4	>+7.5V							
	--	--		TP1	--		TP3	--							
Set P_2 to 0.0V.	TP1	+5.0V		A4	-6.0V		A4	<-7.5V							
	--	--		TP1	--		TP3	--							
Connect oscilloscope to TP1, 7. Set Trigger on (-) slope. Reset.	Transient DC voltage at TP1, 7 will drop to >+4.75V and then rise to +5.0V±.020V in <1.5 mseconds _____.												A4	-6.0V	
													TP1	--	

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2															
Connect α_1 to TP20, α_2 to TP21, α_3 to TP22;	A7A1	>+10V		A7A2	<-10V		A7A3	<-10V		A7A4	<-10V		A7A5	<-10V	
α_4 to TP23, 24, 25. Set P_1, P_2, P_3, P_4 to	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
-5.0V±.002V. Set Reject Limit Switch to "3".	A7A6	<-10V		TP2	+5.0V		A8	-5.0V		A8	>+7.5V		A8	<-7.5V	
Reset. Increase P_1 to -6.20V±.020V.	TP7	--			--		TP1	--		TP3	--		TP4	--	
	J5-	+5.0V													
	R	--													
Increase P_2 to -6.25V±.020V.	A7A1	>+10V		A7A2	>-10V		A7A3	<-10V		A7A4	<-10V		A7A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A6	<-10V		TP2	-5.0V		A8	-6.0V		A8	>+7.5V		A8	<-7.5V	
	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
Increase P_3 to -6.34V±.020V.	A7A1	>+10V		A7A2	>-10V		A7A3	>+10V		A7A4	<-10V		A7A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A6	<-10V		TP2	+5.0V		A8	-7.0V		A8	<-7.5V		A8	>+7.5	
	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
	Lockdown														
	Light "On"														

TABLE IV - TSCS (302) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Connect: TP23 to α_1; TP24 to α_2. Set P_1, P_2,	TP2	+5.0V		A8	-7.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
to -5.0V±.002V.	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1 to -10.0V±.002V.	TP2	+6.0V		A7A1	>+10V		A7A2	>+10V		A7A3	>+10V		A7A4	<-10V	
Set P_2 to -3.0V±.002V.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A5	<-10V		A8	-7.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light "On"		
Using "Manual Reject" patch on Test Point Panel,	TP2	+4.0V		A7A1	>+10V		A7A2	>+10V		A7A3	>+10V		A7A4	<-10V	
patch out Channel No. 3.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A7A5	<-10V		A8	-8.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light "On"		
Connect: α_1 to TP20; α_2 to TP21; α_3 to TP22;	TP2	+5.0V		A8	-4.0V		A8	>+7.5V		A8	<-7.5V				
α_4 to TP23, 24, 25. Remove "Manual Reject"	--	--		TP1	--		TP3	--		TP4	--				
patch pin. Set P_1, P_2, P_3, P_4 to -5.0V±.002V.															
Reject Limit Switch set to "2". Reset.															
Set P_1, P_2 to -3.0V±.002V.	TP2	+5.0V		A8	-6.0V		A8	<-7.5V		A8	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Reset.	TP2	+5.0V		A8	-6.0V		A8	< -7.5V		A8	> +7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1, P_2, P_3 to -5.0V±.002V.	TP2	+5.0V		A8	-6.0V		A8	< -7.5V		A8	> +7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset.	TP2	+5.0V		A8	-4.0V		A8	> +7.5V		A8	< -7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "Off"		
Set P_6 to zero. Remove ground from α_6 to TP-7.	TP2	+8.0V		A8	-4.0V		J10-	< -8V		J10-	< -8V		J10-	< +9V	
Set P_1, P_2, P_3, P_4 to -8.0V±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J10-	< +9.0V													
	35	--													
Increase P_6 to -1.0V±.020V.	TP2	+8.0V		A8	-4.0V		J10-	< -8V		J10-	> +10V		J10-	< +9V	
	--	--		TP1	--		18	--		34	--		4	--	
	J10-	> +11V		"B Reject"											
	35	--		Light "On"											
Set P_5 to zero. Remove ground from α_5 to TP7.	TP2	+8.83V		A8	-4.0V		J10-	< -8V		J10-	> +10V		J10-	< +10V	
Set P_5 to -.50V ±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J10-	> +11V		"B Reject"											
	35	--		Light "On"											

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ± 020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Set P_5, P_6 to zero.	TP2	+8.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V		J10-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+9.0V		"B Reject"											
	35	--		Light "Off"											
Set P_5 to -1.00V ±.020V.	TP2	+8.0V		A8	-4.0V		J10-	>+10V		J10-	<-8V		J10-	> +11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+9V		"A Reject"											
	35	--		Light "On"											
Set P_6 to -.50V ±.002V.	TP2	+8.83V		A8	-4.0V		J10-	>+10V		J10-	<-8V		J10-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J10-	<+10V		"A Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP2	+8.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V		J10-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J10	<+9V		"A Reject"											
	35	--		Light "Off"											

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Connect: α_8 to TP7; α_7 to α_1; TP20, 21, 25 to α_2. Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP2, 7. Set to trigger on (+) slope.	TP2	+5.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V				
	--	--		TP1	--		18	--		34	--				
Close S_{X1}.	Transient DC voltage at TP2, 7 will rise to <+6.0V and then decay to +5.0V±0.020V in <500μ seconds _____. "A Reject" Light "On"_____.														
Connect: α_7 to TP7; α_8 to α_1; TP20, 21,.... 25 to α_2. Open S_{X1}. Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP2, 7. Set to trigger on (+) slope.	TP2	+5.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V				
	--	--		TP1	--		18	--		34	--				
Close S_{X1}.	Transient DC voltage at TP2, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ Seconds _____. "B Reject" Light "On"_____.														
Connect: α_7, α_8, to TP7; TP20 to α_1; TP21, 22, ...25 to α_2. Open S_{X1}. Set P_1, P_2 to -5.0V±.002V. Connect oscilloscope to TP2, 7. Set to trigger on (+) slope.	TP2	+5.0V		A8	-4.0V		J10-	<-8V		J10-	<-8V				
	--	--		TP1	--		18	--		34	--				

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 2 (Continued)															
Close S_{X1}.	Transient DC voltage at TP2, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500 μ seconds _____.														
Connect: α_7, α_8, to TP7; TP20 to α_1, TP21 to α_2, TP22 to α_3; TP23, 24, 25 to α_4. Open S_{X1}. Set P_1, P_2, P_3, P_4 to -5.0V±.002V. Set Reject Limit Switch to "2". Reset.	TP2	+5.0V		A8	-4.0V										
	--	--		TP1	--										
Set P_1 to 0.0V.	TP2	+5.0V		A8	-5.0V		A8	>+7.5V							
	--	--		TP1	--		TP3								
Set P_2 to 0.0V.	TP2	+5.0V		A8	-6.0V		A8	<-7.5V							
	--	--		TP1	--		TP3	--							
Connect oscilloscope to TP2, 7. Set trigger on (-) slope. Reset.	Transient DC voltage at TP2, 7 will drop to >+2.5V and then rise to +5.0V±.020V in <200μ seconds _____.												A8 TP-1	-6.0V	

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 3															
Connect: α_1 to TP30; α_2 to TP31; α_3 to TP32;	A11A1	>+10V		A11A2	<-10V		A11A3	<-10V		A11A4	<-10V		A11A5	<-10V	
α_4 to TP33, 34, 35. Set P_1, P_2, P_3, P_4 to	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
-5.0V±.002V. Set Reject Limit Switch to "3".	A11A6	<-10V		TP3	+5.0V		A12	-5.0V		A12	>+7.5V		A12	<-7.5V	
Reset. Increase P_1 to -6.20V±.020V.	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
	J5-b	+5.0V --													
Increase P_2 to -6.25V±.020V.	A11A1	>+10V		A11A2	>+10V		A11A3	<-10V		A11A4	<-10V		A11A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A11A6	<-10V		TP3	+5.0V		A12	-6.0V		A12	>+7.5V		A12	<-7.5V	
	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
Increase P_3 to -6.34V±.020V.	A11A1	>+10V		A11A2	>+10V		A11A3	>+10V		A11A4	<-10V		A11A5	<-10V	
	TP7	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A11A6	<-10V		TP3	+5.0V		A12	-7.0V		A12	<-7.5V		A12	>+7.5V	
	TP7	--		--	--		TP1	--		TP3	--		TP4	--	
	Lockdown Light "On"														

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 3 (Continued)															
Connect: TP33 to α_1; TP34 to α_2. Set P_1, P_2 to	TP3	+5.0V		A12	-7.0V		A12	<-7.5V		A12	>+7.5V		Lockdown		
-5.0V±.002V.	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1 to -10.0V±.002V.	TP3	+6.0V		A11A1	>+10V		A11A2	>+10V		A11A3	>+10V		A11A4	<-10V	
Set P_2 to -3.0V±.002V.		--		TP7	--		TP7	--		TP7	--		TP7	--	
	A11A5	<-10V		A12	-7.0V		A12	<-7.5V		A12	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light "On"		
Using "Manual Reject" patch on Test Point Panel,	TP3	+4.0V		A11A1	>+10V		A11A2	>+10V		A11A3	>+10V		A11A4	<-10V	
patch out Channel No. 3.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A11A5	<-10V		A12	-8.0V		A12	<-7.5V		A12	>+7.5V		Lockdown		
	TP7	--		TP1	--		TP3	--		TP4	--		Light "On"		
Connect: α_1 to TP30; α_2 to TP31; α_3 to TP32;	TP3	+5.0V		A12	-4.0V		A12	>+7.5V		A12	<-7.5V				
α_4 to TP33, 34, 35. Remove "Manual Reject"	--	--		TP1	--		TP3	--		TP4	--				
patch pin. Set P_1, P_2, P_3, P_4 to -5.0V±.002V.															
Set Reject Limit Switch to "2". Reset.															
Set P_1, P_2 to -3.0V±.002V.	TP3	+5.0V		A12	-6.0V		A12	<-7.5V		A12	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 3 (Continued)															
Reset.	TP3	+5.0V		A12	-6.0V		A12	<-7.5V		A12	>+7.5V		Lockdown		
	--	--		TP1			TP3	--		TP4	--		Light "On"		
Set P_1, P_2, P_3 to -5.0V±.002V.	TP3	+5.0V		A12	-6.0V		A12	<-7.5V		A12	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset.	TP3	+5.0V		A12	-4.0V		A12	>+7.5V		A12	<-7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "Off"		
Set P_6 to zero. Remove ground from $\curvearrowleft_6$ to TP7.	TP3	+8.0V		A12	-4.0V		J14-	<-8V		J14-	<-8V		J14-	<+9V	
Set P_1, P_2, P_3, P_4 to -8.0V±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J14-	<+9V													
	35	--													
Increase P_6 to -1.0V±.020V.	TP3	+8.0V		A12	-4.0V		J14-	<-8V		J14-	>+10V		J14-	<+9V	
	--	--		TP1	--		18	--		34	--		4	--	
	J14-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5 to zero. Remove ground from $\curvearrowleft_5$ to TP7.	TP3	+8.83V		A12	-4.0V		J14-	<-8V		J14-	>+10V		J14-	<+10V	
Set P_5 to -.50V±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J14-	>+11V		"B Reject"											
	35	--		Light "On"											

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 3 (Continued)															
Set P_5, P_6 to zero.	TP3	+8.0V		A12	-4.0V		J14-	<-8V		J14-	<-8V		J14-	<-9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J14-	<+9V		"B Reject"											
	35	--		Light "Off"											
Set P_5 to -1.00V±.020V.	TP3	+8.0V		A12	-4.0V		J14-	>-10V		J14-	<-8V		J14-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J14-	<+9V		"A Reject"											
	35	--		Light "On"											
Set P_6 to -5.0V±.002V.	TP3	+8.83V		A12	-4.0V		J14-	>+10V		J14-	<-8V		J14-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J14-	<+10V		"A Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP3	+8.0V		A12	-4.0V		J14-	<-8V		J14-	<-8V		J14-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J14-	<+9V		"A Reject"											
	35	--		Light "Off"											

TABLE IV - TSCS (302) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 3 (Continued)															
Connect: α_8 to TP7; α_7 to α_1; TP30, 31, ... 35 to α_2. Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP3, 7. Set to trigger on (+) slope.	TP3	+5.0V		A12	-4.0V		J14-	<-8V		J14-	<-8V				
	--	--		TP1	--		18	--		34	--				
Close S_{X1}.	Transient DC voltage at TP3, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____. "A Reject" Light "On"_____.														
Connect: α_7 to TP7; α_8 to α_1; TP30, 31, ... 35 to α_2. Open S_{X1}. Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP3, 7. Set to trigger on (+) slope.	TP3	+5.0V		A12	-4.0V		J14-	<-8V		J14-	<-8V				
	--	--		TP1	--		18	--		34	--				
Close S_{X1}.	Transient DC voltage at TP3, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____. "B Reject" Light "On"_____.														
Connect: α_7, α_8, to TP7; TP30 to α_1; TP31, 32, ...35 to α_2. Open S_{X1}. Set P_1, P_2 to -5.0V ±.002V. Connect oscilloscope to TP3, 7. Set to trigger on (+) slope.	TP3	+5.0V		A12	-4.0V		J14-	<-8V		J14-	<-8V				
	--	--		TP1	--		18	--		34	--				

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ± 020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 3 (Continued)															
Close S_{X1}.	Transient DC voltage at TP3, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____.														
Connect: α_7, α_8, to TP7; TP30 to α_1; TP31 to α_2; TP32 to α_3; TP33, 34, 35 to α_4. Open S_{X1}. Set P_1, P_2, P_3, P_4, to -5.0V±.002V. Set Reject Limit Switch to "2". Reset.	TP3	+5.0V		A12	-4.0V										
	--	--		TP1	--										
Set P_1 to 0.0V.	TP3	+5.0V		A12	-5.0V		A12	>+7.5V							
	--	--		TP1	--		TP3	--							
Set P_2 to 0.0V.	TP3	+5.0V		A12	-6.0V		A12	<+7.5V							
	--	--		TP1	--		TP3	--							
Connect oscilloscope to TP3, 7. Set trigger on (-) slope. Reset.	Transient DC voltage at TP3, 7 will drop to >+2.5V and then then rise to +5.0V±.020V in <200μ seconds _____.												A12	-6 V	
													TP1	--	

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 4															
Connect: α_1 to TP40; α_2 to TP41; α_3 to TP42,	A15A1	>+10V		A15A2	<-10V		A15A3	<-10V		A15A4	<-10V		TP4	+5.0V	
43. Set P_1, P_2, P_3 to -5.0V±.002V. Set Reject	TP7	--		TP7	--		TP7	--		TP7	--		--	--	
Limit Switch to "2". Reset. Increase P_1 to -6.33V	A16	-5.0V		A16	>+7.5V		A16	<7.5V		J5-	+5.0V				
±.020V.	TP1	--		TP3	--		TP4	--		M	--				
Increase P_2 to -6.50V±.020V.	A15A1	>+10V		A15A2	>+10V		A15A3	<-10V		A15A4	<-10V		TP4	+5.0V	
	TP7	--		TP7	--		TP7	--		TP7	--		--	--	
	A16	-6.0V		A16	<-7.5V		A16	>+7.5V		Lockdown					
	TP1	--		TP3	--		TP4	--		Light "On"					
Connect: TP42 to α_1; TP43 to α_2. Set P_1, P_2,	TP4	+5.0V		A16	-6.0V		A16	<-7.5V		A16	>+7.5V		Lockdown		
to -5.0V±.002V.	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1 to -10.0V±.002V.	TP4	+6.5V		A15A1	>+10V		A15A2	>+10V		A15A3	<-10V		A15A4	<-10V	
Set P_2 to -3.0V±.002V.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A16	-6.0V		A16	<-7.5V		A16	>+7.5V		Lockdown					
	TP1	--		TP3	--		TP4	--		Light "On"					

TABLE IV - TSCS (302) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ± .020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION No. 4 (Continued)															
Using "Manual Reject" Patch on Test Point Panel,	TP4	+3.0V		A15A1	>+10V		A15A2	>+10V		A15A3	>+10V		A15A4	<-10V	
patch out Channel No . 2.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A16	-7.0V		A16	<-7.5V		A16	>+7.5V		Lockdown					
	TP1	--		TP3	--		TP4	--		Light "On"					
Connect: α_1 to TP40; α_2 to TP41; α_3 to TP42,	TP4	+5.0V		A16	-4.0V		A16	>+7.5V		A16	<-7.5V				
43. Remove "Manual Reject" patch pin. Set P_1,	--	--		TP1	--		TP3	--		TP4	--				
P_2, P_3 to -5.0V±.002V. Set Reject Limit Switch to "1". Reset.															
Set P_1 to -3.0V±.020V.	TP4	+5.0V		A16	-5.0V		A16	<-7.5V		A16	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset.	TP4	+5.0V		A16	-5.0V		A16	<-7.5V		A16	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1, P_2 to -5.0V±.002V.	TP4	+5.0V		A16	-5.0V		A16	<-7.5V		A16	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset.	TP4	+5.0V		A16	-4.0V		A16	>+7.5V		A16	<-7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "Off"		

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 4 (Continued)															
Set P_6 to zero. Remove ground from α_6 to TP-7	TP4	+8.0V		A16	-4.0V		J18-	<-8V		J18-	<-8V		J18-	<+9V	
Set P_1, P_2, P_3 to -8.0V±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J18-	<+9V													
	35	--													
Increase P_6 to -0.80V±.020.	TP4	+8.0V		A16	-4.0V		J18-	<-8V		J18-	>+10V		J18-	<+9V	
	--	--		TP1	--		18	--		34	--		4	--	
	J18-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5 to zero. Remove ground from α_5 to TP7.	TP4	+8.50V		A16	-4.0V		J18-	<-8V		J18-	>+10V		J18-	<+10.2V	
Set P_5 to -.20V ±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J18-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero. RESET	TP4	+8.0V		A16	-4.0V		J18-	<-8V		J18-	<-8V		J18-	<+9V	
	--	--		TP1	--		18	--		34	--		4	--	
	J18-	<+9V		"B Reject"											
	35	--		Light "Off"											

TABLE IV - TSCS (302) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 4 (Continued)															
Set P_5 to -0.80V±.020V.	TP4	+8.0V		A16	-4.0V		J18-	>+10V		J18-	<8V		J18-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J18-	<+9V		"A Reject"											
	35	--		Light "On"											
Set P_6 to -.20V ±.002V.	TP4	+8.5V		A16	-4.0V		J18-	>+10V		J18-	<-8V		J18-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J18-	<+10.2V		"A Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP4	+8.0V		A16	-4.0V		J18-	<-8V		J18-	<-8V		J18-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J18-	<+9V		"A Reject"											
	35	--		Light "Off"											
Connect: α_8 to TP7; α_7 to α_1; TP40, 41, 42, 43 to α_2; Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP4, 7. Set to trigger on (+) slope.	TP4	+5.0V		A16	-4.0V		J18-	<-8V		J18-	<-8V				
	--	--		TP1	--		18	--		34	--				
Close S_{X1}.	Transient DC voltage at TP4, 7 will rise to <+6.0V and then decay to +5.00V±.020V in <500μ seconds _____. "A Reject" Light "On"_____.														

TABLE IV - TSCS (302) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 4 (Continued)															
Connect: α_7 to TP7; α_8 to α_1; TP40, 41, 42, 43 to α_2. Open S_{X1}. Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP4, 7. Set to trigger on (+) slope.	TP4 --	+5.0V --		A16 TP1	-4.0V --		J18- 18	<-8V --		J18- 34	<-8V --				
Close S_{X1}.	Transient DC voltage at TP4, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____. "B Reject" Light "On"_____.														
Connect: α_7, α_8, to TP7; TP40 to α_1; TP41, 42, 43 to α_2. Open S_{X1}. Set P_1, P_2 to -5.0V± .002V. Connect oscilloscope to TP4, 7. Set to trigger on (+) slope.	TP4 --	+5.0V --		A16 TP1	-4.0V --		J18- 18	<-8V --		J18- 34	<-8V --				
Close S_{X1}.	Transient DC voltage at TP 4, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____.														
Connect: α_7, α_8, to TP7; TP40 to α_1; TP41 to α_2; TP42, 43 to α_3. Open S_{X1}. Set P_1, P_2, P_3 to -5.0V±.002V. Set Reject Limit Switch to "1". Reset.	TP4 --	+5.0V --		A16 TP1	-4.0V --										

TABLE IV - TSCS (302) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 4 (Continued)															
Set P_1 to 0.0V.	TP4	+5.0V		A16	-5.0V		A16	-2.5							
	--	--		TP1	--		TP3	--							
										Lockdown Light "On"					
Connect oscilloscope to TP4, 7. Set trigger on (-) slope. Reset.	Transient DC voltage at TP4,7 will drop to > +2.5V and then rise to +5.0V±.020V in <200μ seconds_____.												A16 TP1	-5.0V --	

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 5															
Connect: α_1 to TP50; α_2 to TP51; α_3 to TP52,	A19A1	>+10V		A19A2	<-10V		A19A3	<-10V		A19A4	< -10V		TP5	+5.0V	
53. Set P_1, P_2, P_3 to -5.0V±.002V. Set Reject	TP7	--		TP7	--		TP7	--		TP7	--				
Limit Switch to "2". Reset. Increase P_1 to -6.33V	A20	-5.0V		A20	>+7.5V		A20	<-7.5V		J5-	+5.0V				
±.020V.	TP1	--		TP3	--		TP4	--		X	--				
Increase P_2 to -6.50V±.020V.	A19A1	>+10V		A19A2	>+10V		A19A3	<+10V		A19A4	<-10V		TP5	+5.0V	
	TP7	--		TP7	--		TP7	--		TP7	--				
	A20	-6.0V		A20	<-7.5V		A20	>+7.5V		Lockdown					
	TP1	--		TP3	--		TP4	--		Light "On"					
Connect: TP52 to α_1; TP53 to α_2. Set P_1, P_2	TP5	+5.0V		A20	-6.0V		A20	<7.5V		A20	>+7.5V		Lockdown		
to -5.0V±.002V.	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1 to -10.0V±.002V.	TP5	+6.5V		A19A1	>+10V		A19A2	>+10V		A19A3	<-10V		A19A4	<-10V	
Set P_2 to -3.0V±.002V.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A20	-6.0V		A20	<-7.5V		A20	>+7.5V		Lockdown					
	TP1	--		TP3	--		TP4	--		Light "On"					

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 5 (Continued)															
Using "Manual Reject" Patch on Test Point Panel,	TP5	+3.0V		A19A1	>+10V		A19A2	>+10V		A19A3	<-10V		A19A4	<-10V	
patch out Channel No. 2.	--	--		TP7	--		TP7	--		TP7	--		TP7	--	
	A20	-7.0V		A20	<-7.5V		A20	>+7.5V		Lockdown					
	TP1	--		TP3	--		TP4	--		Light "On"					
Connect: α_1 to TP50; α_2 to TP51; α_3 to TP52,	TP5	+5.0V		A20	-4.0V		A20	>+7.5V		A20	<-7.5V				
53. Remove "Manual Reject" Patch Pin. Set P_1,	--	--		TP1	--		TP3	--		TP4	--				
P_2, P_3 to -5.0V±.002V. Set Reject Limit Switch to "1". Reset.															
Set P_1 to -3.0V±.020V.	TP5	+5.0V		A20	-5.0V		A20	<-7.5V		A20	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset.	TP5	+5.0V		A20	-5.0V		A20	<-7.5V		A20	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Set P_1, P_2 to -5.0V±.002V.	TP5	+5.0V		A20	-5.0V		A20	<-7.5V		A20	>+7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "On"		
Reset.	TP5	+5.0V		A20	-4.0V		A20	>+7.5V		A20	<-7.5V		Lockdown		
	--	--		TP1	--		TP3	--		TP4	--		Light "Off"		

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 5 (Continued)															
Set P_6 to zero. Remove ground from α_6 to TP-7	TP5	+8.0V		A20	-4.0V		J22-	<-8V		J22-	<-8V		J22-	<+9V	
Set P_1, P_2, P_3 to -8.0V±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J22	<+9V													
	35	--													
Increase P_6 to -0.80V±0.020V.	TP5	+8.0V		A20	-4.0V		J22-	<-8V		J22-	>+10V		J22-	<+9V	
	--	--		TP1	--		18	--		34	--		4	--	
	J22-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5 to zero. Remove ground from α_5 to TP7.	TP5	+8.5V		A20	-4.0V		J22-	<-8V		J22-	>+10V		J22-	<+10.2V	
Set P_5 to -.20V ±.002V.	--	--		TP1	--		18	--		34	--		4	--	
	J22-	>+11V		"B Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP5	+8.0V		A20	-4.0V		J22-	<-8V		J22-	<-8V		J22-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J22-	<+9V		"B Reject"											
	35	--		Light "Off"											

TABLE IV - TSCS (302) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 5 (Continued)															
Set P_5 to -0.80V±.020V.	TP5	+8.0V		A20	-4.0V		J22-	>+10V		J22-	<-8V		J22-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J22-	<+9V		"A Reject"											
	35	--		Light "On"											
Set P_6 to -.20V ±.002V.	TP5	+8.5V		A20	-4.0V		J22-	>+10V		J22-	<-8V		J22-	>+11V	
	--	--		TP1	--		18	--		34	--		4	--	
	J22-	<+10.2V		"A Reject"											
	35	--		Light "On"											
Set P_5, P_6 to zero.	TP5	+8.0V		A20	-4.0V		J22-	<-8V		J22-	<-8V		J22-	<+9V	
Reset	--	--		TP1	--		18	--		34	--		4	--	
	J22-	<+9V		"A Reject"											
	35	--		Light "Off"											
Connect: α_8 to TP7; α_7 to α_1; TP50, 51, 52,	TP5	+5.0V		A20	-4.0V		J22-	<-8V		J22-	<-8V				
53 to α_2; Set P_1 to zero and P_2 to -5.0V±.002V.	--	--		TP1	--		18	--		34	--				
Reset. Connect oscilloscope to TP5, 7. Set to trigger on (+) slope.															

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TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 5 (Continued)															
Close S_{X1}.	Transient DC voltage at TP5, 7, will rise to <+6.0V and then decay to +5.0V±.020V in < 500μ seconds _____. "A Reject" Light "On"_____.														
Connect: α_7 to TP7; α_8 to α_1; TP40, 41, 42, 43 to α_2. Open S_{X1}. Set P_1 to zero and P_2 to -5.0V±.002V. Reset. Connect oscilloscope to TP5, 7. Set to trigger on (+) slope.	TP5	+5.0V		A20	-4.0V		J22-	<-8V		J22-	<-8V			
	--	--		TP1	--		18	--		34	--				
Close S_{X1}.	Transient DC voltage at TP5, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____. "B Reject" Light "On"_____.														
Connect: α_7, α_8 to TP7; TP50 to α_1; TP51, 52, 53 to α_2. Open S_{X1}. Set P_1, P_2 to -5.0V± .002V. Connect oscilloscope to TP5, 7. Set to trigger on (+) slope.	TP5	+5.0V		A20	-4.0V		J22-	<-8V		J22-	<-8V			
	--	--		TP1	--		18	--		34	--				
Close S_{X1}	Transient DC voltage at TP5, 7 will rise to <+6.0V and then decay to +5.0V±.020V in <500μ seconds _____.														

TABLE IV - TSCS (G02) Continued

TEST CONDITIONS	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE ±.020V	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE	TEST LOC.	CALX. VALUE	MEAS. VALUE
STATION NO. 5 (Continued)															
Connect: α_7, α_8, to TP7; TP50 to α_1; TP51 to α_2. TP52, 53 to α_3. Open S_{X1}. Set P_1, P_2, P_3 to -5.0V±.002V. Set Reject Limit Switch to 1. Reset.															
Set P_1 to 0.0V.	TP5	+5.0V		A20	-5.0V		A20	<-7.5							
	--	--		TP1	--		TP3	--							
										Lockdown Light "On"					
Connect oscilloscope to TP5, 7. Set trigger on (-) slope. Reset.	Transient DC voltage at TP5, 7 will drop to >+3.75V and then rise to +5.0V±.020V in <200μ seconds_____.												A20 TP1	-5.0V --	

TABLE V - ECS (G01)

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V
STATION NO. 1								
Connect: α_1 to TP10, 11 ... 19; α_7, α_8, to TP7. S_{X1} open. Set P_1 to -5.0V ±.002V. Reset.	None	None	0	A4 TP1	-4.0V --		A4 TP3	<-7.5V --
Reset.	None		1		-4.0V			>+7.5V
	0		1		-5.0V			<-7.5V
	0		2		-5.0V			>+7.5V
	0, 1		2		-6.0V			<-7.5V
	0, 1		3		-6.0V			>+7.5V
	0, 1, 2		3		-7.0V			<-7.5V
	0, 1, 2		4		-7.0V			>+7.5V
	0, 1, 2, 3		4		-8.0V			<-7.5V
	0, 1, 2, 3		5		-8.0V			>+7.5V
	0, 1, 2, 3, 4		5		-9.0V			<-7.5V

TABLE V - ECS (G01) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value +.050V	Meas. Value	Test Loc.	Calx. Value +.050V
STATION NO. 1 (Continued)								
Reset.	0, 1, 2, 3, 4	None	6	A4 TP1	-9.0V		A4 TP3	>+7.5V
	0, 1, 2, 3, 4, 5		6		-10.V			<-7.5V
	None	0, 1, 2, 3, 4, 5	4		-4.0V			>+7.5V
	6	NONE	4		-5.0V			>+7.5V
	6, 7		4		-6.0V			>+7.5V
	6, 7, 8		4		-7.0V			>+7.5V
								--
	6, 7, 8, 9		4		-8.0V			<-7.5V
	None	All	4		-4.0V			>+7.5V

TABLE V - ECS (G01) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V
STATION NO. 2								
Connect: α_1 to TP20, 21,	None	None	0	A8	-4.0V		A8	<-7.5V
...29; α_7, α_8 to TP7. S_{X1}				TP1	--		TP3	--
open. Set P_1 to -5.0V±.002								
V. Reset.								
Reset.	None		1		-4.0V			>+7.5V
	0		1		-5.0V			<-7.5V
	0		2		-5.0V			>+7.5V
	0, 1		2		-6.0V			<-7.5V
	0, 1		3		-6.0V			>+7.5V
	0, 1, 2		3		-7.0V			<-7.5V
	0, 1, 2		4		-7.0V			>+7.5V
	0, 1, 2, 3		4		-8.0V			<-7.5V
	0, 1, 2, 3		5		-8.0V			>+7.5V

TABLE V - ECS (301) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V
STATION NO. 2 (Continued)								
Reset.	0, 1, 2, 3, 4	None	5		-9.0V			<-7.5V
	0, 1, 2, 3, 4		6		-9.0V			>+7.5V
	0, 1, 2, 3, 4, 5		6	A8	-10V		A8	<-7.5V
				TP1	--		TP3	--
	None	0, 1, 2, 3, 4, 5	4		-4.0V			>+7.5V
	6	NONE			-5.0V			
	6, 7				-6.0V			
	6, 7, 8				-7.0V			
	6, 7, 8, 9				-8.0V			<-7.5V
	None	All			-4.0V			>+7.5V

TABLE VI - TSCS (302)

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V	
STATION NO. 1									
Connect: α_1 to TP10, 11	None	None	0	A4	-4.0V		A4	<-7.5V	
...15; α_7, α_8 to TP7.				TP1	--		TP3	--	
Open S_{X1}. Set P_1 to									
-5.0V±.002V. Reset.									
Reset.	None		1		-4.0V			>+7.5V	
	0		1		-5.0V			<-7.5V	
	0		2		-5.0V			>+7.5V	
	0, 1		2		-6.0V			<-7.5V	
	0, 1		3		-6.0V			>+7.5V	
	0, 1, 2		3		-7.0V			<-7.5V	
	None	0, 1, 2	3		-4.0V			>+7.5V	
	4	None			-5.0V				
	4, 5				-6.0V				

TABLE VI - TSCS (G02) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calc. Value ±.050V	Meas. Value	Test Loc.	Calc. Value ±.050V
STATION NO. 1 (Continued)								
Reset (Continued)	4, 5, 6	None	3	A4 TP1	-7.0V		A4 TP3	<-7.5V
	None	All			-4.0V			>+7.5V
STATION NO. 2								
Connect: α_1 to TP20, 21,	None	None	0	A8	-4.0V		A8	<-7.5V
...25; α_7, α_8 to TP7.				TP1	--		TP3	--
S_{X1} open. Set P_1 to -5.0V ±.002V. Reset.								
Reset.	None	None	1		-4.0V			>+7.5V
	0	None	1					
					-5.0V			<-7.5V
	0		2		-5.0V			>+7.5V
	0, 1		2		-6.0V			<-7.5V
	0, 1		3		-6.0V			>+7.5V

TABLE VI - TSCS (302) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V
STATION NO. 2 (Continued)								
RESET	0, 1, 2	NONE	3	A8 TP1	-7.0V		A8 TP3	<-7.5V
	None	0, 1, 2			-4.0V			>+7.5V
	4	NONE			-5.0V			
	4, 5				-6.0V			
	4, 5, 6				-4.0V			<-7.5V
	None	All						>+7.5V
STATION NO. 3								
Connect: α_1 to TP30, 31	None	None	0	A12	-4.0V		A12	<-7.5V
...35; α_7, α_8 to TP7. S_{X1}				TP1	--		TP3	--
open. Set P_1 to -5.0V±.002								
V. Reset.								

TABLE VI - TSCS (G02) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V
STATION NO. 3(Continued)								
Reset.	None	None	1	A12 TP1	-4.0V		A12 TP3	>+7.5V
	0		1		-5.0V			<-7.5V
	0		2		-5.0V			>+7.5V
	0, 1		2		-6.0V			<-7.5V
	0, 1		3		-6.0V			>+7.5V
	0, 1, 2	None	3		-7.0V			<-7.5V
	None	0, 1, 2			-4.0V			>+7.5V
	4	NONE			-5.0V			
	4, 5				-6.0V			
	4, 5, 6				-7.0V			<-7.5V
	None	A11			-4.0V			>+7.5V

TABLE VI - TSCS (302) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V
STATION NO. 4								
Connect: α_1 to TP40, 41, 42, 43; α_7, α_8 to TP7. S_{X1} open. Set P_1 to -5.0V±.002V. Reset.	None	None	0	A16	-4.0V		A16	<-7.5V
				A1	--		A3	--
Reset.	None		1		-4.0V			>+7.5V
	0		1		-5.0V			<-7.5V
	0		2		-5.0V			>+7.5V
	0, 1		2		-6.0V			<-7.5V
	None	0, 1			-4.0V			>+7.5V
	2	NONE			-5.0V			>+7.5V
	2, 3				-6.0V			<-7.5V
	None	All			-4.0V			>+7.5V

TABLE VI - TSCS (302) Continued

TEST CONDITIONS	Insert Manual Reject Pins No.	Remove Manual Reject Pins No.	Set Reject Limit Sw. To	Test Loc.	Calx. Value ±.050V	Meas. Value	Test Loc.	Calx. Value ±.050V
STATION NO. 5								
Connect: α_1 to TP50, 51,	None	None	0	A20	-4.0V		A20	<-7.5V
52, 53; α_7, α_8 to TP7.				TP1	--		TP3	--
S_{X1} open. Set P_1 to -5.0V								
±.002V. Reset.								
Reset.	None		1		-4.0V			>+7.5V
	0		1		-5.0V			<-7.5V
	0		2		-5.0V			>+7.5V
	0, 1		2		-6.0V			<-7.5V
	None	0, 1			-4.0V			>+7.5V
	2	NONE			-5.0V			>+7.5V
	2, 3				-6.0V			<-7.5V
	None	All			-4.0V			>+7.5V

TABLE VII

CIRCUIT CONDITIONS	TEST FROM	TO LEAD NO.	ECS MM READS < 1	TSCS MM READS ⌐	COMMENTS
C/O Switch in "Operate"	J4-A	2542			
	J2-A	2536			
	J4-C	2550			
	J2-C	2544			
	J4-E	2558			
	J2-E	2552			
	J4-G	2566			
	J2-G	2560			
	J4-J	2574			
	J2-J	2568			
	J4-L	2582			
	J2-L	2576			
	J4-N	2590			
	J2-N	2584			
	J4-R	2598			
	J2-R	2592			
	J4-T	2606			
	J2-T	2600			
	J4-V	2614			
	J2-V	2608			
	J4-B	TP-7			
	J2-B				
	J4-D				

TABLE VII (Continued)

			ECS	TSCS	
CIRCUIT CONDITIONS	TEST FROM	TO LEAD NO.	MM READS ∠ 1 -2		COMMENTS
C/O Switch In "Operate"	J2-D	TP7			
	J4-F				
	J2-F				
	J4-H				
	J2-H				
	J4-K				
	J2-K				
	J4-M				
	J2-M				
	J4-P				
	J2-P				
	J4-S				
	J2-S				
	J4-U				
	J2-U				
	J4-W				
	J2-W				
	J4-v	J4-w			
C/O Switch in "Checkout"	J4-w	J4-AA			
K1 in Simulate	J4-w	J4-x			
C/O Switch in "Operate"	J2-X	2656			
	J4-X	2662			
	J2-Z	2664			
	J4-Z	2670			
	J2-b	2672			

TABLE VII (Continued)

CIRCUIT CONDITIONS	TEST FROM	TO LEAD NO.	ECS MM READS	TSCS MM READS	COMMENTS
C/O Switch in "Operate"	J4-b	2678			
	J2-d	2680			
	J4-d	2686			
	J2-f	2688			
	J4-f	2694			
	J2-h	2696			
	J4-h	2702			
	J2-j	2704			
	J4-j	2710			
	J2-m	2712			
	J4-m	2718			
	J2-p	2720			
	J4-p	2726			
	J2-r	2728			
	J4-r	2734			
	J2-Y	TP7			
	J4-Y				
	J2-a				
	J4-a				
	J2-c				
	J4-c				
	J2-e				
	J4-e				
	J2-g				
	J4-g				

TABLE VII (Continued)

			ECS	TSCS	
CIRCUIT CONDITIONS	TEST FROM	TO LEAD NO.	MM READS ∠ 1 ⌐		COMMENTS
C/O Switch in "Operate"	J2-i	TP7			
	J4-i				
	J2-k				
	J4-K				
	J2-n				
	J4-n				
	J2-q				
	J4-q				
	J2-s				
	J4-s				
	J2-t	2768			
	J2-v	2773			
	J2-x	2778			
	J2-z	2783			
	J2-BB	2788			
	J2-DD	2793			
	J2-FF	2798			
	J3-A	2803			
	J3-C	2808			
	J3-E	2813			
	J2-u	TP7			
	J2-w				
	J2-y				
	J2-AA				
	J2-CC				

TABLE VII (Continued)

CIRCUIT CONDITIONS	TEST FROM	TO LEAD NO.	ECS MM READS ∠	TSCS MM READS ~	COMMENTS
C/O Switch In "Operate"	J2-EE	TP7			
	J2-GG				
	J3-B				
	J3-D				
	J3-F				
	J3-G	2846			
	J3-J	2851			
	J3-L	2856			
	J3-N	2861			
	J3-R	2866			
	J3-T	2871			
	J3-V	2876			
	J3-X	2881			
	J3-Z	2886			
	J3-b	2891			
	J3-H	TP7			
	J3-K				
	J3-M				
	J3-P				
	J3-S				
	J3-U				
	J3-W				
	J3-Y				
	J3-a				
	J3-c				

TABLE VII (Continued)

			ECS	TSCS	
CIRCUIT CONDITIONS	TEST FROM	TO LEAD NO.	MM READS ∠ 1 ⌐		COMMENTS
C/O Switch in "Operate"	J3-d	2923			
	J3-f	2928			
	J3-h	2933			
	J3-j	2938			
	J3-m	2943			
	J3-p	2948			
	J3-r	2953			
	J3-t	2958			
	J3-v	2963			
	J3-x	2968			
	J3-e	TP7			
	J3-g				
	J3-l				
	J3-k				
	J3-n				
	J3-q				
	J3-s				
	J3-u				
	J3-w				
	J3-y				

CIRCUIT CONDITIONS	TEST FROM	TO LEAD NO.	ECS MM READS < 1 Ω	TSCS MM READS < 1 Ω	COMMENTS
C/O Switch in "Operate"	J2-A	J6-9			
	J2-C	J6-13			
	J2-E	J6-26			
	J2-G	J6-17			
	J2-J	J6-6			
	J2-L	J6-32			
	J2-N	J6-10			
	J2-R	J6-12			
	J2-T	J6-14			
	J2-V	J6-25			
	J2-X	J10-9			
	J2-Z	J10-13			
	J2-b	J10-26			
	J2-d	J10-17			
	J2-f	J10-6			
	J2-h	J10-32			
	J2-j	J10-10			
	J2-m	J10-12			
	J2-p	J10-14			
	J2-r	J10-25			
	J2-t	J14-9			
	J2-v	J14-13			
	J2-x	J14-26			
	J2-z	J14-17			

TEST SPECIFICATION NUMBER T-711860

TITLE

Subsystem Acceptance Test Specification and Procedure

XE-1 Ten-Channel Averager

DATE: March 30, 1966

PREPARED BY:

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Control Equipment Design & Fabrication
Control Systems Engineering
Instrumentation and Control

Quality Engineering

REVISION A
Redesigned Auto Reject and Trigger Modules.

INFORMATION CATEGORY

Authorized Classifier Date

SUBSYSTEM ACCEPTANCE TEST SPECIFICATION AND PROCEDURE
XE-1 Ten-Channel Averager

1.1 The following tests are to be made on a module and P/C card level of subject equipment before the P/C cards are interfaced with the chassis and the final Acceptance Test Procedure (ATP) is initiated. All setups to be simple lab lashups--no special test rigs to be built up. These tests are not intended to be final acceptance tests of individual boards but supplemental tests to the ten channel averager final assembly. Note: "E" numbers and pin numbers have the same meaning in this specification.

1.1.1 Averaging Amplifier P/C Board (909E598)

1.1.1.1 Check out of Averager module (909E595)

Connect module as per Figure 1.

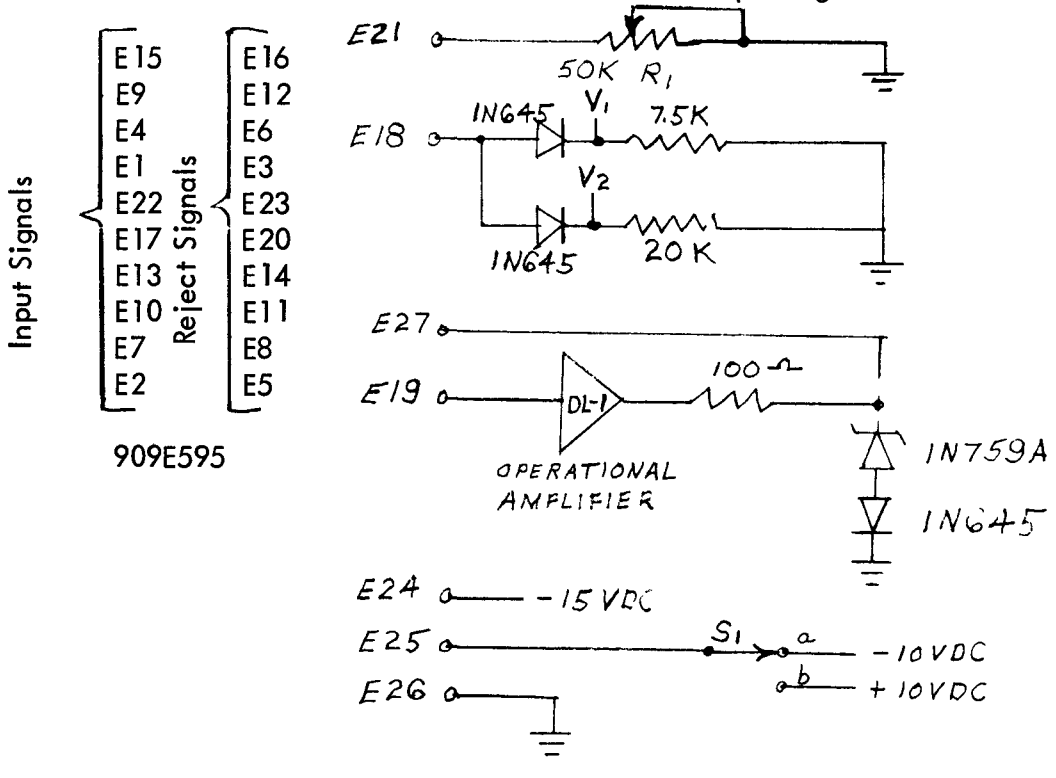

Figure 1

1.1.1.2 A total of fourteen (14) Averager mdoules will be tested in the following groups:

ECS -- 4 -- 10 ch (G03)

TSCS -- 6 -- 6 ch (G02)

TSCS -- 4 -- 4 ch (G01)

1.1.1.3 Check out per Table I

Table I-A is for 10 ch, Table I-B is for 6 ch, Table I-C is for 4 ch. Ground all input signals and apply +10VDC to all reject signals except when Table I states different inputs.

Adjust R_1 so that V_2 = +8VDC when -8V input signal is applied at input signal terminals.

TABLE I-A Prepotting

IDN _ _ _ _

-10VDC E	V1 0.000	V_2 0.000	-10VDC E	-8.000 E	V1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

IDN ____ TABLE I-A Prepotting

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000 E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

TABLE I-A Prepotting

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000 E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

TABLE I-A Prepotting

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000V E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	14		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

TABLE I-B Prepotting

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

TABLE I-B Prepotting

IDN _ _ _ _

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN _ _ _ _

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN _ _ _ _

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN ____

TABLE I-B Prepotting

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

TABLE I-C Prepotting

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000 E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		

TABLE I-C Prepotting

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000V E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000V E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		

TABLE I-A Postpotting

IDN _ _ _ _

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000V E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

IDN _ _ _ _

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000V E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	7		
6			6	4		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

TABLE I-A Postpotting

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000VDC E	V_1 +8.000VDC	V_2 +8.000VDC
16			16	15		
12			12	7		
6			6	4		
3			3	1		
23			23	22		
20			20	17		
14			14	13		
11			11	10		
8			8	7		
5			5	2		

Table I-B Post potting

IDN ____

-10 VDC E	V_1 0.000	V_2 0.000	-10 VDC E	-8.000 VDC E	V_1 +8.000 VDC	V_2 +8.000 VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN ____

16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN ____

16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

Table I-B Postpotting

IDN ____

-10 VDC E	V_1 0.000	V_2 0.000	-10 VDC E	-8.000 VDC E	V_1 +8.000 VDC	V_2 +8.000 VDC
16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN ____

16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

IDN ____

16			16	15		
12			12	9		
6			6	4		
3			3	1		
23			23	22		
20			20	17		

Table I-C Postpotting

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000 E	V_1 +8.000	V_2 +8.000
16			16	15		
12			12	9		
6			6	4		
3			3	1		

IDN ____

16			16	15		
12			12	9		
6			6	4		
3			3	1		

IDN ____

-10VDC E	V_1 0.000	V_2 0.000	-10VDC E	-8.000 E	V_1 +8.000	V_2 +8.000
16			16	15		
12			12	9		
6			6	4		
3			3	1		

IDN ____

16			16	15		
12			12	9		
6			6	4		
3			3	1		

1.1.2 Averaging Amplifier P/C Board (909E598)

Record test results in Table II.

1.1.2.1 Apply ±15VDC to pins 1, 2, and return to 3.

1.1.2.2 Allow 30 minute warm-up.

1.1.2.3 Apply -8.000VDC to pins 9, 13, 26, 17, 6, 32, 10, 12, 14, and 25 (Signal Inputs).

1.1.2.4 Apply -10.00VDC to pins 8, 11, 15, 16, 5, 33, 30, 29, 28, and 27 (Reject Inputs).

1.1.2.5 Apply -10.00VDC to pin 18.

1.1.2.6 Apply +10.00VDC to pin 34.

1.1.2.7 Adjust R_3 until pin 7 is +8.000VDC with a 20K load from pin 7 to gnd. Record pin 7 voltage.

1.1.2.8 Remove -10VDC and apply +10.00VDC to pin 18.

1.1.2.9 Remove +10VDC and apply -10.00VDC to pin 34.

1.1.2.10 Adjust R_6 until pin 31 is +8.000VDC with a 20K load from pin 31 to gnd. Record pin 31 voltage.

1.1.2.11 Remove +10VDC and apply -10.00VDC to pin 18.

1.1.2.12 Maintain -10.00VDC to pin 34.

1.1.2.13 Connect pin 7 and 31, read voltage at pins 7 and 31, +8.000VDC, with a 10K load from pin 7 or 31 to gnd.

TABLE II

IDN							
1.1.2.7							
1.1.2.10							
1.1.2.13							

1.2 Auctioneer P/C Board (909E597)

1.2.1 Check out Comparator module (909E590). Record test data in Table III.

1.2.1.1 Connect: +15V to E1; return to E8; 0 to +15V variable to E_5; 0 to -15V variable to E_{13} circuit per Figure 2 to E_{12}; DVM to E_{16} set R_3 CCW; E_5 = +9.50V; E_{13} = -7.70V.

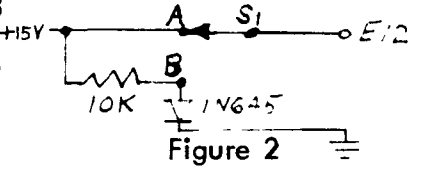

Figure 2

1.2.1.2 E_{16} < +0.6V. S_1 position "A".

1.2.1.3 E_{16} < +0.6V. S_2 position "B".

1.2.1.4 Open S_1 to position "A". Adjust pot R_3 CW until DVM reads > +8.0V.

1.2.1.5 Close S_1 to Position "B". DVM reads < +1.5V

1.2.1.6 Set E_5 = +7.70V. DVM reads < +1.5V. Increase E_5 to +12.00V. DVM reads <+1.5V.

1.2.1.7 Open S_1 to "A" and set E_5 = +6.70V. DVM reads < +1.5V.

1.2.1.8 Adjust R_3 CW until DVM reads > +8.0V.

1.2.1.9 Set E_5 = +10.00V and E_{13} -10.00V. DVM > +8.0V.

1.2.1.10 Connect E_4 to +15V. DVM > +8.0V.

1.2.1.11 Reduce E_5 to zero. DVM > +8.0V.

1.2.1.12 There are a total of 14 comparator modules to be tested.

ECS - 4
TSCS - 10
14

1.2.2 Checkout High Signal Selector mdoule (909E594)

1.2.2.1 Ground all inputs; $E_{3'}$ $E_{7'}$ $E_{11'}$ $E_{15'}$ $E_{19'}$ $E_{4'}$ $E_{8'}$ $E_{12'}$ $E_{16'}$ and E_{20}. Apply +10V to all rejects; $E_{1'}$ $E_{5'}$ $E_{9'}$ $E_{13'}$ $E_{17'}$ $E_{6'}$ $E_{10'}$ $E_{14'}$ $E_{18'}$ and E_{22}; except when Table IV states different inputs. There are a total of 7 high signal select modules to be tested.

ECS - 2 - 10 channel
TSCS - 5 - (3-6 channel + 2-4 channel)

1.2.2.2 Table IV-A - 10 channel table, IV-B - 6 channel table, IV-C - 4 channel table.

1.2.2.3 Complete Table IV.

TABLE III Prepotting

IDN							
1.2.1.4							
1.2.1.5							
1.2.1.6							
1.2.1.7							
1.2.1.8							
1.2.1.9							
1.2.1.10							
1.2.1.11							

TABLE III Postpotting

IDN							
1.2.1.4							
1.2.1.5							
1.2.1.6							
1.2.1.7							
1.2.1.8							
1.2.1.9							
1.2.1.10							
1.2.1.11							

TABLE III Prepotting

IDN							
1.2.1.4							
1.2.1.5							
1.2.1.6							
1.2.1.7							
1.2.1.8							
1.2.1.9							
1.2.1.10							
1.2.1.11							

TABLE III Postpotting

IDN							
1.2.1.4							
1.2.1.5							
1.2.1.6							
1.2.1.7							
1.2.1.8							
1.2.1.9							
1.2.1.10							
1.2.1.11							

Table IV-A Prepotting

IDN ____

-10 VDC E	E 21 0.000	-10 VDC E	-5 VDC E	E 21 -5.0 VDC
1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	
10		10	8	
14		14	12	
18		18	16	
22		22	20	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	
10		10	8	
14		14	12	
18		18	16	
22		22	20	

Table IV-B Prepotting

IDN ____

-10 VDC E	E 21 0.000	-10 VDC E	-5 VDC E	E 21 -5.0 VDC
1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	

Table IV-C Prepotting

IDN ____

-10 VDC E	E 21 0.000	-10 VDC E	-5 VDC E	E 21 -5.0 VDC
1		1	3	
5		5	7	
9		9	11	
13		13	15	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	

Table IV-A Postpotting

IDN ____

-10 VDC E	E 21 0.000	-10 VDC E	-5 VDC E	E 21 -5.0 VDC
1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	
10		10	8	
14		14	12	
18		18	16	
22		22	20	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	
10		10	8	
14		14	12	
18		18	16	
22		22	20	

Table IV-B Postpotting

IDN ____

-10 VDC E	E 21 0.000	-10 VDC E	-5 VDC E	E 21 -5.0 VDC
1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	
17		17	19	
6		6	4	

Table IV-C Postpotting

IDN ____

-10 VDC E	E 21 0.000	-10 VDC E	-5 VDC E	E 21 -5.0 VDC
1		1	3	
5		5	7	
9		9	11	
13		13	15	

IDN ____

1		1	3	
5		5	7	
9		9	11	
13		13	15	

1.2.3 Auctioneer P/C Board (909E597)

Record test data in Table V.

1.2.3.1 Apply ±15VDC to pins 1, 2, return to 3.

1.2.3.2 Allow 30 minutes warm-up.

1.2.3.3 Connect all input signals of the High Signal Selector to -8.000VDC (Pins 30, 11, 12, 20, 15, 28, 26, 23, 21, and 18) Connect all reject signals to -10.00VDC. (Pins 29, 31, 24, 13, 14, 27, 25, 22, 19, and 17)

1.2.3.4 Set R_3 CCW on comparator A4 and A5. Apply +8.50VDC to pin 33, pin 16 is <-8.0VDC.

1.2.3.5 Pin 10 <+1.5VDC.

1.2.3.6 Adjust pin 33 to +9.5VDC. Pin 16 <-8.0VDC.

1.2.3.7 Adjust R_3 of comparator A4 CW until pin 16 > +8.0VDC.

1.2.3.8 Pin 10 > +8.0VDC.

1.2.3.9 Remove voltage at Pin 33 and apply +8.50VDC to Pin 35, Pin 9 < +1.5VDC.

1.2.3.10 Pin 7 < -8.0VDC.

1.2.3.11 Adjust pin 35 to +9.5VDC. Pin 9 <+1.2VDC.

1.2.3.12 Adjust R_3 of comparator A5 CW until pin 9 > +8.0VDC.

1.2.3.13 Pin 7>+8.0VDC.

1.2.3.14 There are seven auctioneer P/C Boards, ECS-2 TSCS-5

1.2.3.15 Apply +8.000VDC to pin 4, adjust R_1 for +8.000VDC at pin 5.

TABLE V

IDN							
1.2.3.4							
1.2.3.5							
1.2.3.6							
1.2.3.7							
1.2.3.8							
1.2.3.9							
1.2.3.10							
1.2.3.11							
1.2.3.12							
1.2.3.13							
1.2.3.14							

1.3 Counter and Lockdown P/C Board (909E599)

1.3.1 One Shot module (909E591). Record test data in Table VI.

1.3.1.1 Set up per Figure 3

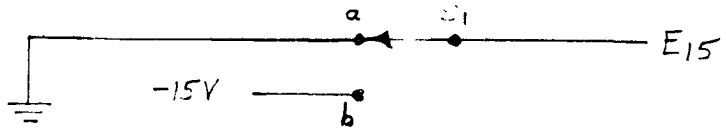

Figure 3

1.3.1.2 Connect +15VDC to E_{11}, -15VDC to E_7, return to E_{14}.

1.3.1.3 Connect a No. "555" Tektronix Scope to E_3.

1.3.1.4 Close S_1 to position "b"; E_6 will be $\tilde{=}$ +15VDC for $\cong$50 microseconds and return to <+0.2VDC.

1.3.1.5 There are a total of seven one shot modules, ECS-2, TSCS-5.

TABLE VI
Prepotting

IDN							
Time							
Voltage							

TABLE VI
Postpotting

IDN							
Time							
Voltage							

1.3.2 Trigger Module (909E593). Record test data in Table VII.

1.3.2.1 Set up per Figure 4.

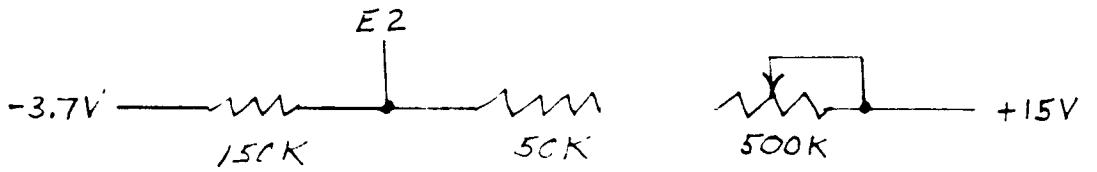

Figure 4

1.3.2.2 Set 500K pot to minimum E_8 $<$ -8.5V.

1.3.2.3 $E_7 >$ +8.5V.

1.3.2.4 Adjust 500K pot until E_8 reads $>$ +8.5V.

1.3.2.5 $E_7 <$ -8.5V.

1.3.2.6 There are a total of 7 trigger modules:

2 - ECS

5 - TSCS

TABLE VII
Prepotting

IDN							
1.3.2.2							
1.3.2.3							
1.3.2.4							
1.3.2.5							

TABLE VII
Postpotting

IDN							
1.3.2.2							
1.3.2.3							
1.3.2.4							
1.3.2.5							

1.3.3 Counter and Lockdown (Complementary Module) P/C Board (909E599).

Record test data in Table VIII.

1.3.3.1 Apply ±15VDC to pins 1, 2, and return to 3.

1.3.3.2 Allow 30 minutes warmup.

1.3.3.3 Balance AR1 in the normal way.

1.3.3.4 Set resistors 2, 15, 16, 17, 18, 19, 20, and 21 CW for minimum resistance.

1.3.3.5 TP-3 > +7.5VDC.

1.3.3.6 TP-4 < -7.5VDC.

1.3.3.7 Apply +15VDC to pin 18. Adjust R_2 until TP1 = -3.70VDC.

1.3.3.8 Adjust R_{15} until TP3 < -7.5VDC.

1.3.3.9 TP4 > +7.5VDC.

1.3.3.10 Adjust R_2 until TP1 reads -4.7VDC.

1.3.3.11 TP3 > +7.5VDC.

1.3.3.12 Remove +15VDC from pin 18. Apply +15VDC to pin 15, TP3 > +7.5VDC.

1.3.3.13 Adjust R_{16} until TP3 < -7.5VDC.

1.3.3.14 Set R_2 until TP1 = -5.70VDC.

1.3.3.15 Remove +15VDC from pin 15. Apply +15VDC to pin 13, TP3 > +7.5VDC.

1.3.3.16 Adjust R_{17} until TP3 < -7.5VDC.

1.3.3.17 Set R_2 until TP1 = -6.70VDC.

1.3.3.18 Remove +15VDC from pin 13. Apply +15VDC to pin 11. TP3 > +7.5VDC

1.3.3.19 Adjust R_{18} until TP3 < -7.5VDC.

1.3.3.20 Set R_2 until TP1 = -7.70VDC.

1.3.3.21 Remove +15VDC from pin 11. Apply +15VDC to pin 10. TP3 > +7.5VDC.

1.3.3.22 Adjust R_{19} until TP3 < -7.5VDC.

1.3.3.23 Set R_2 until TP1 = -8.70VDC.

1.3.3.24 Remove +15VDC from pin 10. Apply +15VDC to pin 5. TP3 > +7.5VDC.

1.3.3.25 Adjust R_{20} until TP3 < -7.5VDC.

1.3.3.26 Set R_2 until TP1 = -9.70VDC.

1.3.3.27 Remove +15VDC from pin 5. Apply +15VDC to pin 6. TP3 > +7.5VDC.

1.3.3.28 Adjust R_{21} until TP3 < -7.5VDC

1.3.3.29 Resistors 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14 will be adjusted (See Section 1.5) after the auto reject cards are aligned. The auto reject P/C board and the Lockdown P/C board will then be a matched pair and should not be separated.

1.3.3.30 There are a total of 7 Lockdown Complement P/C Boards:

2 - ECS

5 - TSCS

TABLE VIII

IDN							
1.3.3.5							
1.3.3.6							
1.3.3.7							
1.3.3.8							
1.3.3.9							
1.3.3.10							
1.3.3.11							
1.3.3.12							
1.3.3.13							
1.3.3.14							
1.3.3.15							
1.3.3.16							
1.3.3.17							
1.3.3.18							
1.3.3.19							
1.3.3.20							
1.3.3.21							
1.3.3.22							
1.3.3.23							
1.3.3.24							
1.3.3.25							
1.3.3.26							
1.3.3.27							
1.3.3.28							

1.4 Auto-Reject P/C Board (909E596)

1.4.1 Auto-Reject Module (909E592). Record test data in Table IX.

1.4.1.1 Apply +15VDC to $E_{2'}$ -15VDC to $E_{22'}$ return to $E_{19'}$ 0 to+15VDC $E_{6'}$ 0 to -15VDC $E_{10'}$ DVM - $E_{14'}$ $E_{7'}$ $E_{18'}$ and E_3 per Figure 5.

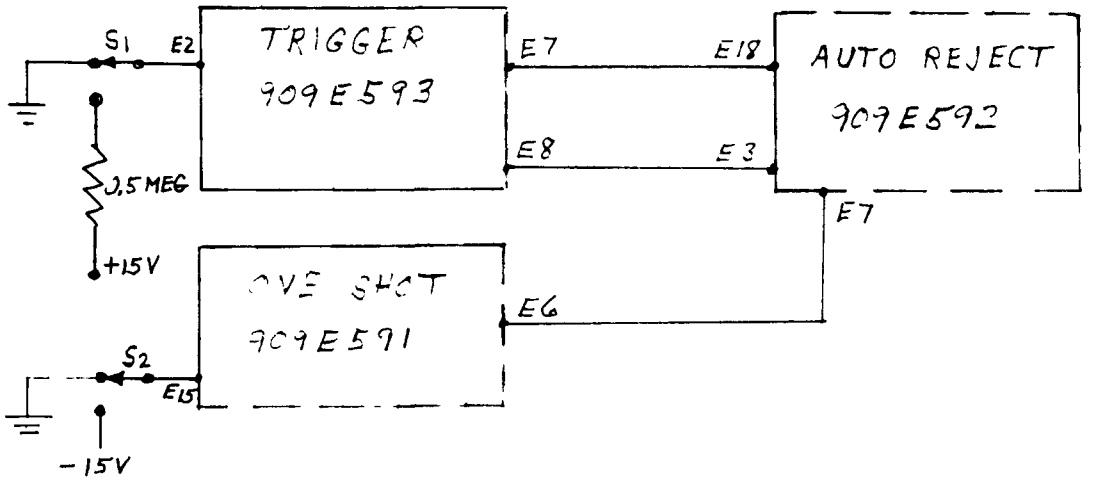

Figure 5

1.4.1.2 Set E_6 (909E592) to +8.00V, E_{10} -8.00V, R_{14} CW and R_3 CCW. Open and close S_2. DVM read < +10.0V.

1.4.1.3 Set E_{10} to -10V. DVM < -10.0V.

1.4.1.4 Adjust R_{14} CCW until DVM reads > +10.0V.

1.4.1.5 Set R_{14} CW open and close S_2. DVM < -10.0V.

1.4.1.6 Set E_{10} to 8.30V. Adjust R_{14} CCW until DVM reads > +10.0V.

1.4.1.7 Set E_{10} to -8.00V. Open and close S_2. DVM < -10.0V.

1.4.1.8 R_{14} full CW. E_{10} = -6.00V. DVM < -10.0V.

1.4.1.9 Adjust R_3 CW until DVM reads > +10.0V.

1.4.1.10 Set R_3 CCW. Open and close S_2. Set E_{10} = -7.70V. DVM reads < -10.0V.

1.4.1.11 Adjust R_3 CW until DVM reads > +10.0V.

1.4.1.12 Set E_{10} = -8.00V. Open and close S_2. DVM reads < -10.0V.

1.4.1.13 Set R_3 CCW and R_{14} full CW. E_{10} = -9.00V. DVM reads < -10.0V.

1.4.1.14 Adjust R_{14} CCW until DVM reads > +10.0V.

1.4.1.15 Set E_{10} = -7.00V. Open and close S_2. DVM reads < -10.0V.

1.4.1.16 Adjust R_3 CW until DVM reads > +10.0V.

1.4.1.17 Set E_{10} = -8.00V. Open and close S_2. DVM < -10.0V.

1.4.1.18 Close S_1, adjust E_{10} from 0-12V, DVM < -10.0V.

1.4.1.19 There are a total of 46 auto-reject modules:

20 - ECS

26 - TSCS

TABLE IX
Prepotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX
Prepotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX
Prepotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX
Prepotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX Prepotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

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TABLE IX
Postpotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX
Postpotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX
Postpotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX
Postpotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

TABLE IX
Postpotting

IDN										
1.4.1.2										
1.4.1.3										
1.4.1.4										
1.4.1.5										
1.4.1.6										
1.4.1.7										
1.4.1.8										
1.4.1.9										
1.4.1.10										
1.4.1.11										
1.4.1.12										
1.4.1.13										
1.4.1.14										
1.4.1.15										
1.4.1.16										
1.4.1.17										
1.4.1.18										
1.4.1.19										

1.4.2 Auto-Reject P/C Board (909E596). Record test data in Table X.

1.4.2.1 Apply ±15VDC to pins 1 and 2, return to pin 3.

1.4.2.2 Allow 30 minutes warmup.

1.4.2.3 Simulate a Signal Average of +8.000VDC to pin 40. Apply -8.000V to pin 4. Connect circuit as shown in Figure 6.

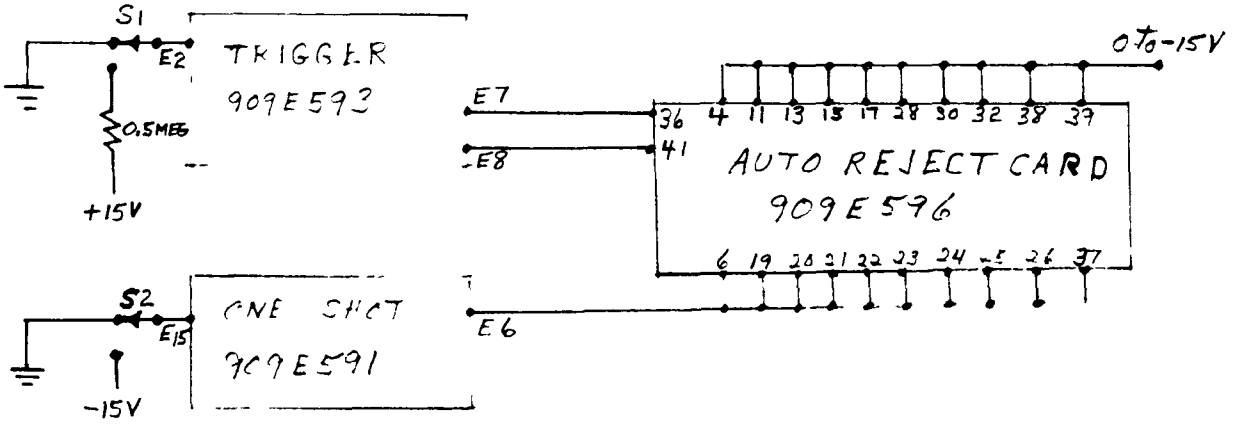

Figure 6

1.4.2.4 Open and close S_2, DVM at pin 10 <-10.0V. (909E596)

1.4.2.5 Pin 12 <-10.0V.

1.4.2.6 Pin 14 <-10.0V.

1.4.2.7 Pin 16 <-10.0V.

1.4.2.8 Pin 18 <-10.0V.

1.4.2.9 Pin 27 <-10.0V.

1.4.2.10 Pin 29 <-10.0V.

1.4.2.11 Pin 31 <-10.0V.

1.4.2.12 Pin 35 <-10.0V.

1.4.2.13 Pin 34 $<$-10.0V.

1.4.2.14 Adjust pin 4 = -9.000V. DVM at pin 10 $>$+10.0V.

1.4.2.15 Pin 12 $>$+10.0V.

1.4.2.16 Pin 14 $>$+10.0V.

1.4.2.17 Pin 16 $>$+10.0V.

1.4.2.18 Pin 18 $>$+10.0V.

1.4.2.19 Pin 27 $>$+10.0V.

1.4.2.20 Pin 29 $>$+10.0V.

1.4.2.21 Pin 31 $>$+10.0V.

1.4.2.22 Pin 35 $>$+10.0V.

1.4.2.23 Pin 34 $>$+10.0V.

1.4.2.24 Set pin 4 = -8.00. Open and close S_2. Read pin 10 $<$-10.0V.

1.4.2.25 Pin 12 $<$-10.0V.

1.4.2.26 Pin 14 $<$-10.0V.

1.4.2.27 Pin 16 $<$-10.0V.

1.4.2.28 Pin 18 $<$-10.0V.

1.4.2.29 Pin 27 $<$-10.0V.

1.4.2.30 Pin 29 $<$-10.0V.

1.4.2.31 Pin 31 $<$-10.0V.

1.4.2.32 Pin 35 $<$-10.0V.

1.4.2.33 Pin 34 $<$-10.0V.

1.4.2.34 Set pin 4 = -7.00V. Read pin 10 > +10.0V.

1.4.2.35 Pin 12 > +10.0V.

1.4.2.36 Pin 14 > +10.0V.

1.4.2.37 Pin 16 > +10.0V.

1.4.2.38 Pin 18 > +10.0V.

1.4.2.39 Pin 27 > +10.0V.

1.4.2.40 Pin 29 > +10.0V.

1.4.2.41 Pin 31 > +10.0V.

1.4.2.42 Pin 35 > +10.0V.

1.4.2.43 Pin 34 > +10.0V.

1.4.2.44 Set pin 4 = -8.00V. Open and close S_2. Read pin 10 < -10.0V.

1.4.2.45 Pin 12 < -10.0V.

1.4.2.46 Pin 14 < -10.0V.

1.4.2.47 Pin 16 < -10.0V.

1.4.2.48 Pin 18 < -10.0V.

1.4.2.49 Pin 27 < -10.0V.

1.4.2.50 Pin 29 < -10.0V.

1.4.2.51 Pin 31 < -10.0V.

1.4.2.52 Pin 35 < -10.0V.

1.4.2.53 Pin 34 < -10.0V.

1.4.2.54 Close S_1. Adjust pin 4 from 0 to -12V. Read pin 10 < -10.0V.

1.4.2.55 Pin 12 <-10.0V.

1.4.2.56 Pin 14 <-10.0V.

1.4.2.57 Pin 16 <-10.0V.

1.4.2.58 Pin 18 <-10.0V.

1.4.2.59 Pin 27 <-10.0V.

1.4.2.60 Pin 29 <-10.0V.

1.4.2.61 Pin 31 <-10.0V.

1.4.2.62 Pin 35 <-10.0V.

1.4.2.63 Pin 34 <-10.0V.

1.4.2.64 There are a total of 7 auto-reject P/C boards:

2 - ECS

5 - TSCS

TABLE X

IDN							
1.4.2.4							
1.4.2.5							
1.4.2.6							
1.4.2.7							
1.4.2.8							
1.4.2.9							
1.4.2.10							
1.4.2.11							
1.4.2.12							
1.4.2.13							
1.4.2.14							
1.4.2.15							
1.4.2.16							
1.4.2.17							
1.4.2.18							
1.4.2.19							
1.4.2.20							
1.4.2.21							
1.4.2.22							
1.4.2.23							
1.4.2.24							
1.4.2.25							
1.4.2.26							
1.4.2.27							
1.4.2.28							
1.4.2.29							
1.4.2.30							
1.4.2.31							
1.4.2.32							

TABLE X
(Continued)

IDN							
1.4.2.33							
1.4.2.34							
1.4.2.35							
1.4.2.36							
1.4.2.37							
1.4.2.38							
1.4.2.39							
1.4.2.40							
1.4.2.41							
1.4.2.42							
1.4.2.43							
1.4.2.44							
1.4.2.45							
1.4.2.46							
1.4.2.47							
1.4.2.48							
1.4.2.49							
1.4.2.50							
1.4.2.51							
1.4.2.52							
1.4.2.53							
1.4.2.54							
1.4.2.55							
1.4.2.56							
1.4.2.57							
1.4.2.58							

TABLE X
(Continued)

IDN							
1.4.2.59							
1.4.2.60							
1.4.2.61							
1.4.2.62							
1.4.2.63							

1.5 Adjustment of remainder of resistors on Lockdown P/C Board (909E599).

Record data in Table XI.

1.5.1 Set up as per Figure 7.

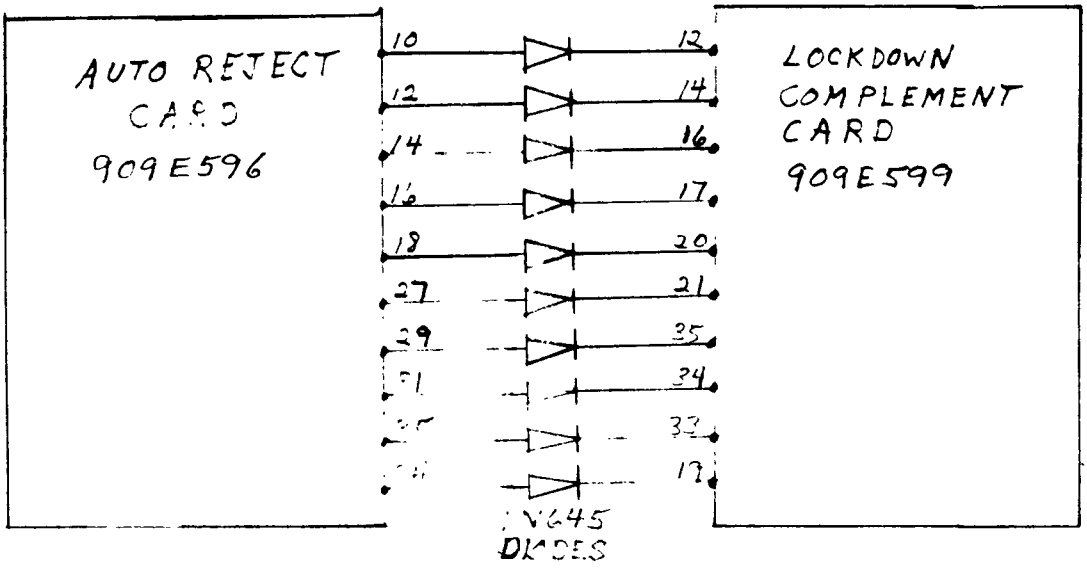

Figure 7

1.5.2 Adjust R_2 until TP1 = -4.000V.

1.5.3 Reject A1 module of auto-reject. Adjust R_5 until TP1 = -5.000V.

1.5.4 Reset A1 module and reject A2 module. Adjust R_6 until TP1 = -5.000V.

1.5.5 Reset A2 module and reject A3 module. Adjust R_7 until TP1 = -5.000V.

1.5.6 Reset A3 module and reject A4 module. Adjust R_8 until TP1 = -5.000V.

1.5.7 Reset A4 module and reject A5 module. Adjust R_9 until TP1 = -5.000V.

1.5.8 Reset A5 module and reject A6 module. Adjust R_{10} until TP1 = -5.000V.

1.5.9 Reset A6 module and reject A7 module. Adjust R_{11} until TP1 = -5.000V.

1.5.10 Reset A7 module and reject A8 module. Adjust R_{12} until TP1 = -5.000V.

1.5.11 Reset A8 module and reject A9 module. Adjust R_{13} until TP1 = -5.000V.

1.5.12 Reset A9 module and reject A10 module. Adjust R_{14} until TP1 = -5.000V.

TABLE XI

IDN							
1.5.2							
1.5.3							
1.5.4							
1.5.5							
1.5.6							
1.5.7							
1.5.8							
1.5.9							
1.5.10							
1.5.11							
1.5.12							

1.6 Lamp Relay Modules (979D426). Record test data in Table XII.

1.6.1 Connect lamp relay modules as follows:

1.6.1.1 Connect +15V to pin 1. Return to pin 7; multimeter (MM) on ohmic scale to pin 3 and pin 4; and pin 2 to variable DC supply (0 to +15V). Set pin 2 to +1.60V, MM reads <1 ohm.

1.6.1.2 Increase voltage at pin 2. Pin 2 reads what voltage when MM $\approx \infty$.

1.6.1.3 Decrease pin 2 to +1.60V. MM reads <1 ohm.

1.6.1.4 Connect per 1.6.1.1 except: MM to pin 3 and pin 6; Set pin 2 to 1.60V, MM reads $\approx \infty$.

1.6.1.5 Increase voltage to pin 2. Pin 2 reads what voltage when MM <1 ohm.

1.6.1.6 There are a total of 21 lamp relay modules:

6 - ECS
15 - TSCS

TABLE XII Prepotting

IDN							
1.6.1.1							
1.6.1.2							
1.6.1.3							
1.6.1.4							
1.6.1.5							

TABLE XII Prepotting

IDN							
1.6.1.1							
1.6.1.2							
1.6.1.3							
1.6.1.4							
1.6.1.5							

TABLE XII Prepotting

IDN							
1.6.1.1							
1.6.1.2							
1.6.1.3							
1.6.1.4							
1.6.1.5							

TABLE XII Postpotting

IDN							
1.6.1.1							
1.6.1.2							
1.6.1.3							
1.6.1.4							
1.6.1.5							

TABLE XII Postpotting

IDN							
1.6.1.1							
1.6.1.2							
1.6.1.3							
1.6.1.4							
1.6.1.5							

TABLE XII Postpotting

IDN							
1.6.1.1							
1.6.1.2							
1.6.1.3							
1.6.1.4							
1.6.1.5							