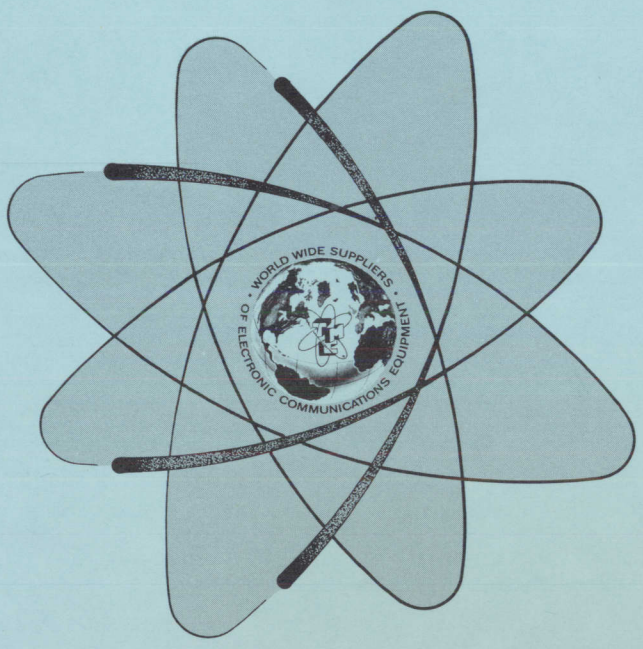
TECHNICAL MANUAL

for

ANALOG DIGITAL CONTROL SYSTEM

MODEL ADC-5A



THE TECHNICAL MATERIEL CORPORATION

MAMARONECK, N.Y. OTTAWA, ONTARIO

Printed in U.S.A.

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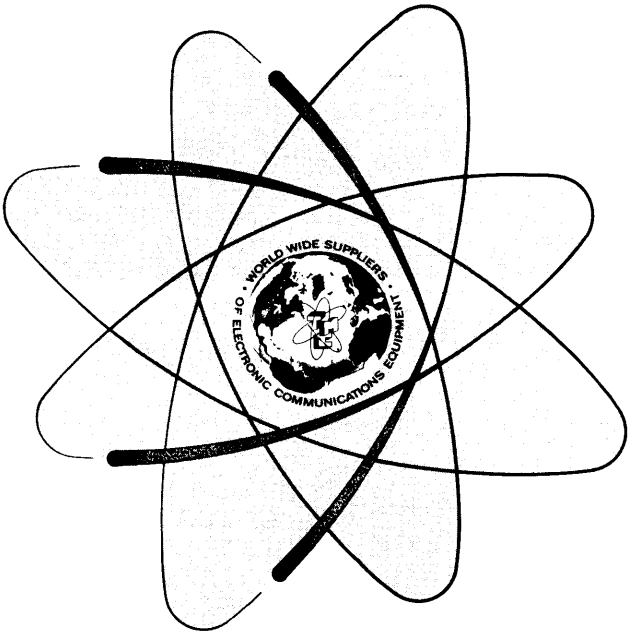

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IN

Issue Date:

THE TECHNICAL MATERIEL CORPORATION
COMMUNICATIONS ENGINEERS
700 FENIMORE ROAD MAMARONECK, N. Y.

Warranty

The Technical Materiel Corporation, hereinafter referred to as TMC, warrants the equipment (except electron tubes,* fuses, lamps, batteries and articles made of glass or other fragile or other expendable materials) purchased hereunder to be free from defect in materials and workmanship under normal use and service, when used for the purposes for which the same is designed, for a period of one year from the date of delivery F.O.B. factory. TMC further warrants that the equipment will perform in a manner equal to or better than published technical specifications as amended by any additions or corrections thereto accompanying the formal equipment offer.

TMC will replace or repair any such defective items, F.O.B. factory, which may fail within the stated warranty period, PROVIDED:

1. That any claim of defect under this warranty is made within sixty (60) days after discovery thereof and that inspection by TMC, if required, indicates the validity of such claim to TMC's satisfaction.
2. That the defect is not the result of damage incurred in shipment from or to the factory.
3. That the equipment has not been altered in any way either as to design or use whether by replacement parts not supplied or approved by TMC, or otherwise.
4. That any equipment or accessories furnished but not manufactured by TMC, or not of TMC design shall be subject only to such adjustments as TMC may obtain from the supplier thereof.

Electron tubes* furnished by TMC, but manufactured by others, bear only the warranty given by such other manufacturers. Electron tube warranty claims should be made directly to the manufacturer of such tubes.

TMC's obligation under this warranty is limited to the repair or replacement of defective parts with the exceptions noted above.

At TMC's option any defective part or equipment which fails within the warranty period shall be returned to TMC's factory for inspection, properly packed with shipping charges prepaid. No parts or equipment shall be returned to TMC, unless a return authorization is issued by TMC.

No warranties, express or implied, other than those specifically set forth herein shall be applicable to any equipment manufactured or furnished by TMC and the foregoing warranty shall constitute the Buyers sole right and remedy. In no event does TMC assume any liability for consequential damages, or for loss, damage or expense directly or indirectly arising from the use of TMC Products, or any inability to use them either separately or in combination with other equipment or materials or from any other cause.

*Electron tubes also include semi-conductor devices.

PROCEDURE FOR RETURN OF MATERIAL OR EQUIPMENT

Should it be necessary to return equipment or material for repair or replacement, whether within warranty or otherwise, a return authorization must be obtained from TMC prior to shipment. The request for return authorization should include the following information:

1. Model Number of Equipment.
2. Serial Number of Equipment.
3. TMC Part Number.
4. Nature of defect or cause of failure.
5. The contract or purchase order under which equipment was delivered.

PROCEDURE FOR ORDERING REPLACEMENT PARTS

When ordering replacement parts, the following information must be included in the order as applicable:

1. Quantity Required.
2. TMC Part Number.
3. Equipment in which used by TMC or Military Model Number.
4. Brief Description of the Item.
5. The *Crystal Frequency* if the order includes crystals.

PROCEDURE IN THE EVENT OF DAMAGE INCURRED IN SHIPMENT

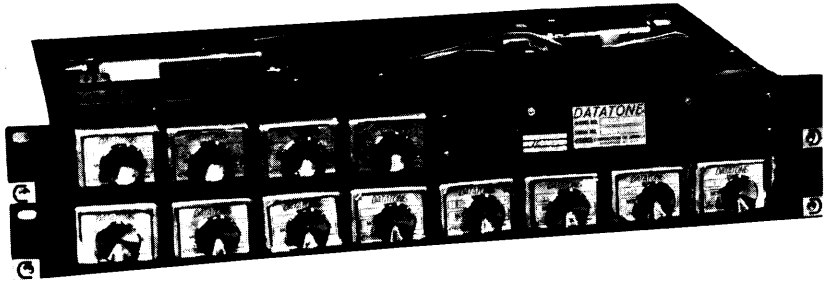
TMC's Warranty specifically excludes damage incurred in shipment to or from the factory. In the event equipment is received in damaged condition, the carrier should be notified immediately. Claims for such damage should be filed with the carrier involved and not with TMC.

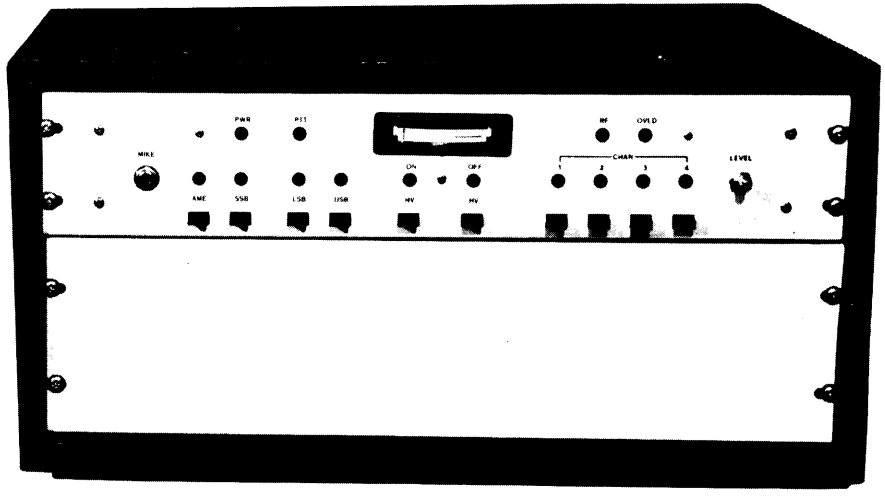
All correspondence pertaining to Warranty Claims, return, repair, or replacement and all material or equipment returned for repair or replacement, within Warranty or otherwise, should be addressed as follows:

THE TECHNICAL MATERIEL CORPORATION
Engineering Services Department
700 Fenimore Road
Mamaroneck, New York

RECORD OF CORRECTIONS MADE

Change No.	Date of Change	Date Entered	Entered By





MODEL ADC-5A

PROGRAMMER/DECODER

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SECTION 1

GENERAL INFORMATION

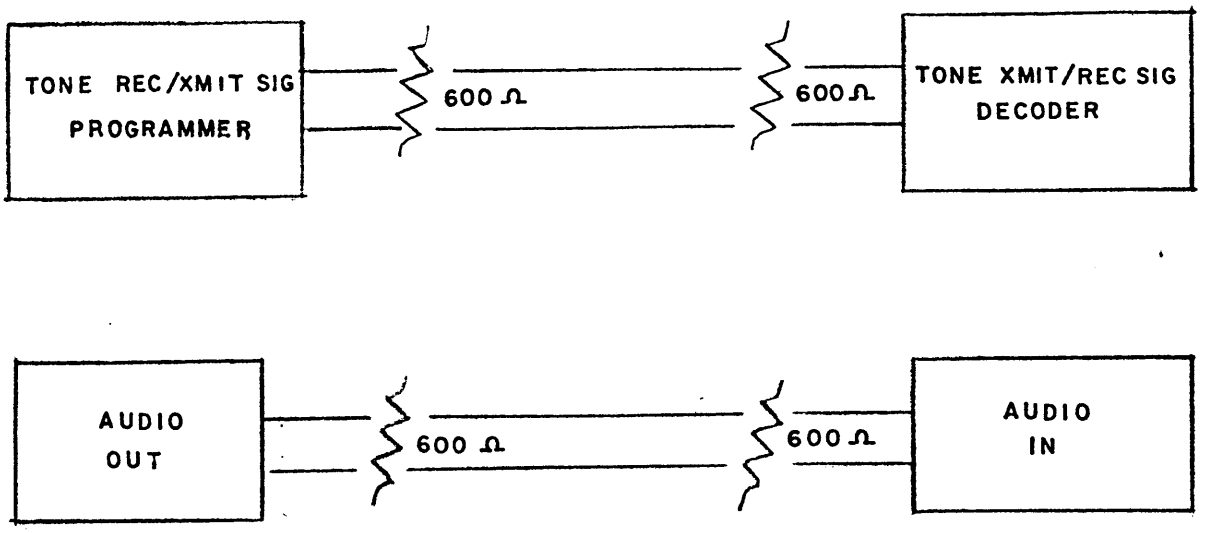
1-1. FUNCTIONAL DESCRIPTION

The Model ADC-5A Analog Digital Control System was designed, assembled and tested by The Technical Materiel Corporation of Mamaroneck, New York. The system makes the operation and use of a TMC Model GPTR - 1KC transmitter from a station remote from the transmitter installation possible. The system provides the facility for making audio intelligence inputs to the transmitter as well as control of several operational functions. Control of the high voltage supply and the selection of the operating mode and carrier frequency channel are possible, as well as the selection of the sideband(s) to be used and the audio input level.

A Model AX5213 programmer located at the remote station and a Model AX5190 Decoder located in the transmitter cabinet make up the system. They are to be interconnected with two pairs of standard 600 ohm transmission lines (physical connection shown in Table 1-2). The operation of remote requires one 600 ohm pair for send and receive. A separate audio pair is needed for audio signal input (voice).

TABLE 1-1. TONE FREQUENCY VS SIGNAL BIT

Bit No.	Frequency Designation	Tone Frequency Hz
1	H1	1209
2	H2	1336
3	H3	1477
4	H4	1633
5	L1	697
6	PTT	770
7	L3	852
8	L4	941
USB	RD BK	2500
LSB	RD BK	2600
HV ON	RD BK	2700
RF PWR	RD BK	2800



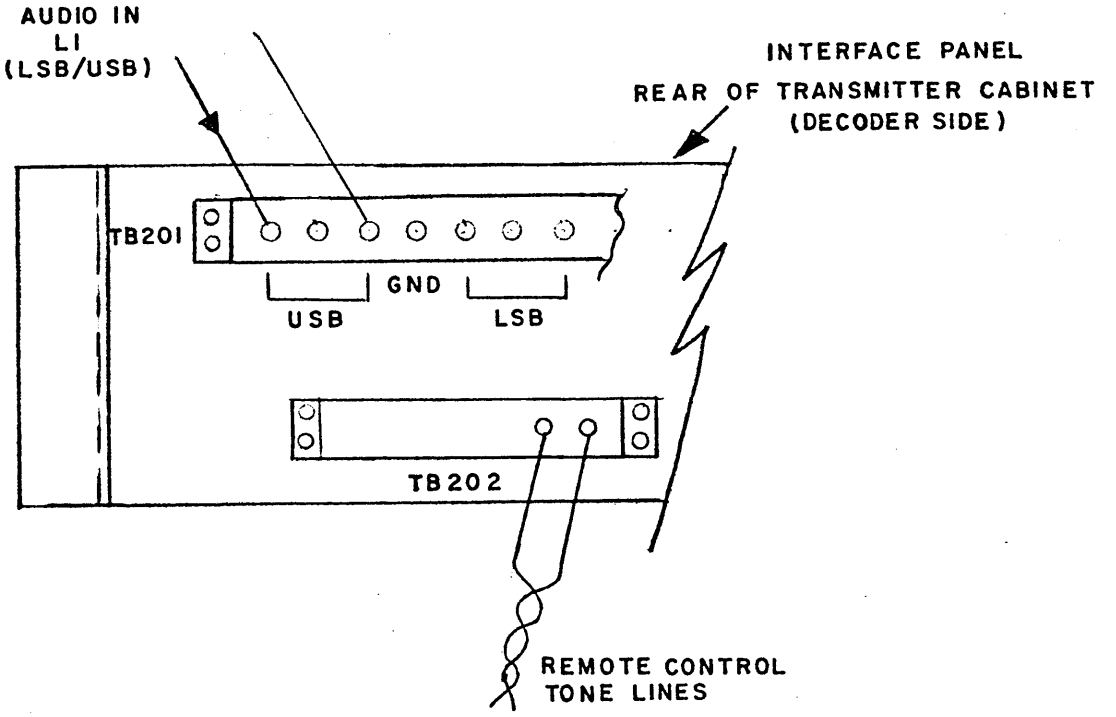


TABLE 1-2
600 OHM TRANSMISSION LINE CONNECTIONS

The function and control signals are generated by the AX5213 Programmer Unit and transmitted to the AX5190 Decoder. The decoder at the transmitter site translates the tone signals to control action signals for the operating units of the transmitter. These action signals cause the transmitter units to be adjusted as dictated by the remote control unit. The decoder unit also generates signals indicative of transmitter status which are transmitted to the remote site. There they are interpreted by the programmer and displayed on the front panel of the unit by indicator lights.

The binary-type code generated for each control function is shown in table 1-3 by bit number and frequency designation.

1-2. PHYSICAL DESCRIPTION

The AX5213 Programmer is housed in a standard equipment cabinet, 20-1/2 inches wide, 10-1/4 inches high and 15 inches deep. It consists of two units; the control unit, on the front panel of which are mounted all of the controls and indicators, and a Datatone* unit, which generates the various frequency tones which make up the binary-type code. It requires a power source of 230 volts AC.

The AX5190 Decoder is mounted on brackets in the transmitter cabinet. It consists only of a Datatone* package and a cable which connects it to the transmitter system.

*NOTE

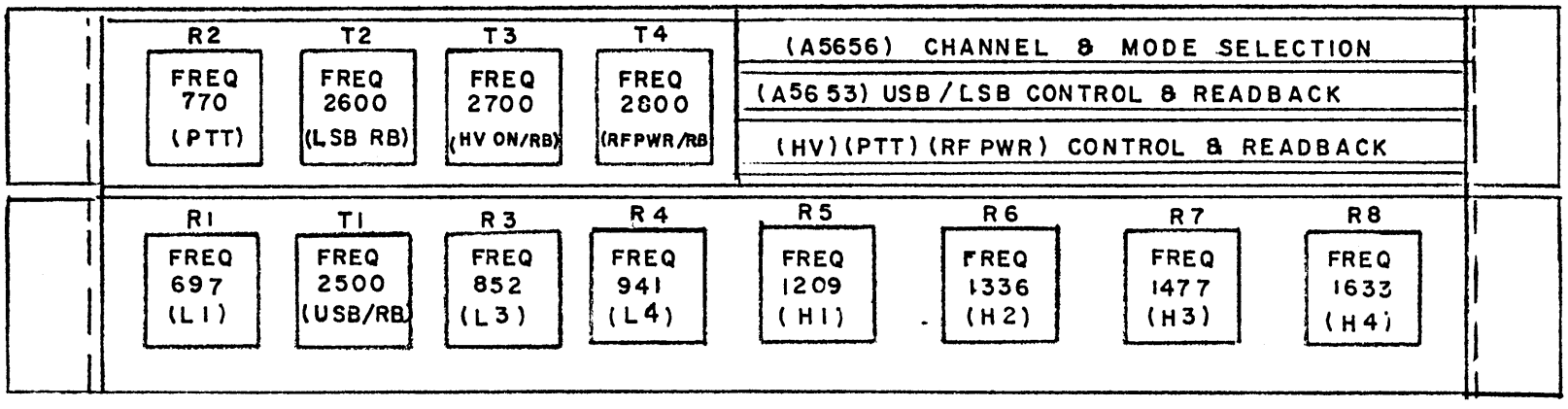
The tone packages were manufactured for The Technical Materiel Corporation by the Trepac Corporation of America to meet TMC specifications. The term Datatone is their registered trade-name.

The Datatone* units are identical in size and weight differing only in their electrical configuration. The unit at the remote site programmer contains fourteen plug-in modules; eight tone generators, four tone receivers and two power supplies. Refer to Table 1-5 for exact location of the tone modules. The converse is true of the unit at the transmitter site. It contains eight tone receivers, four tone generators, and two power supply modules. In addition, a solid state logic system, consisting of three printed circuit boards forms a Decoder package at the transmitter site. Refer to Table 1-4 for the exact location of the eight tone receivers, four tone generators and three printed circuit boards. The system interprets the received tone signals and provides the action commands to the transmitter.

Power and system connections are made at the rear of the units. Each unit is furnished with a cable terminated by a plug to connect the tone package with the associated equipment.

TABLE 1-3. FUNCTION CODE

Frequencies	1209	1336	1477	1633	697	770	852	941	2500	2600	2700	2800
Function Bit No.	1	2	3	4	5	6	7	8				
Channel Select												
1	H1				L1							
2		H2			L1							
3			H3		L1							
4				H4	L1							
Mode Select												
AME		H2					L3					
SSB				H4			L3					
LSB					L1		L3					
USB					L1			L4				
HV-ON	H1	H2										
HV-OFF	H1		H3									
PTT						X						
USB Readback									X			
LSB Readback										X		
HV-ON Readback											X	
RF PWR Readback												X

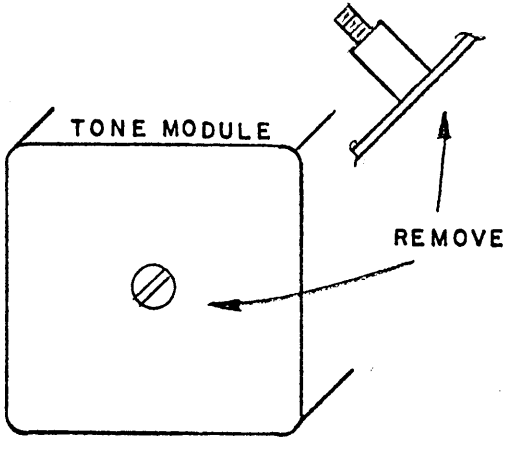


AX5190 (DECODER)
TONE AND PRINTED CIRCUIT BOARD LOCATIONS

TABLE 1-4

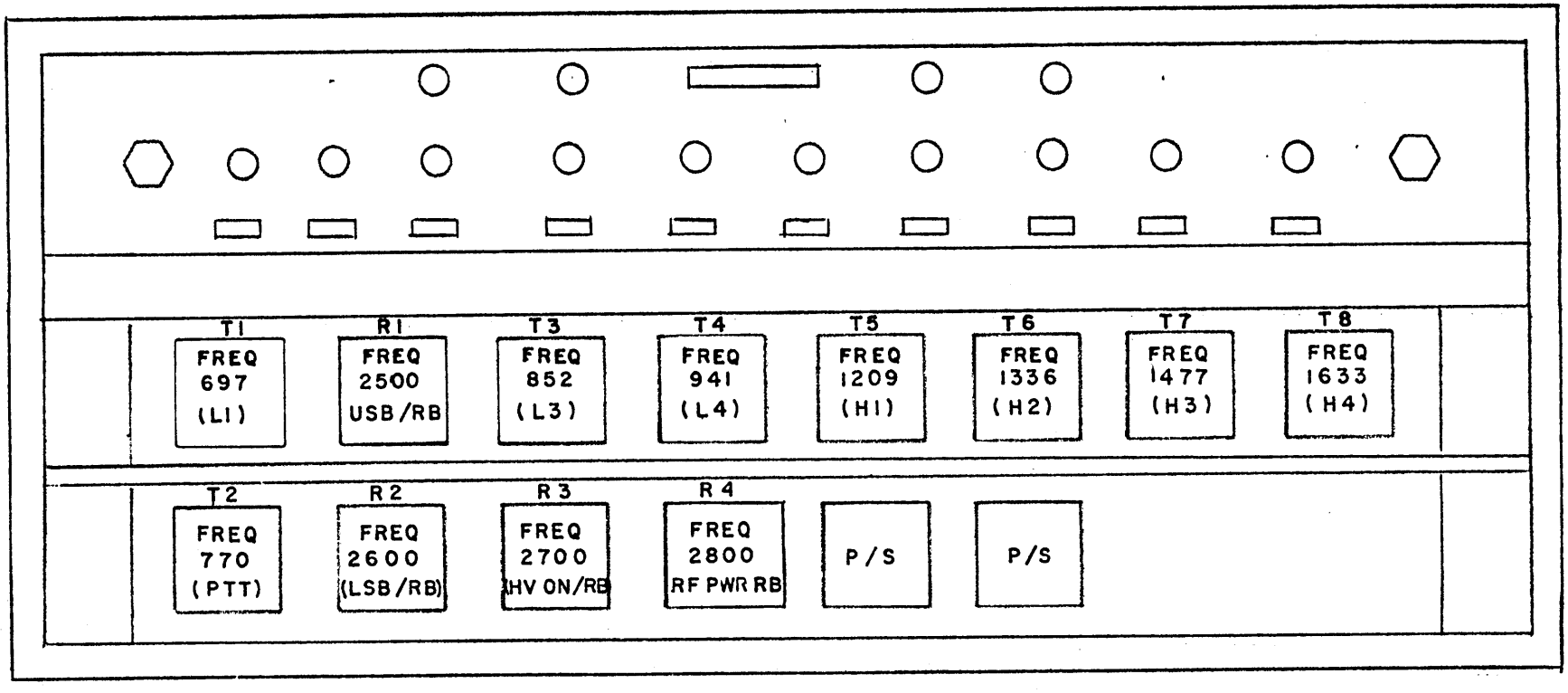
R = RECEIVE

T = TRANSMITT (READBACK)



LINE LEVEL ADJUST

Output level of tones are factory adjusted for 0 dbm level (600 ohm terminated). It may be necessary to lower these levels in system operation to minimize interfering tone products.



AX5213 (PROGRAMMER, TONE SECTION)
TONE LOCATIONS

R = RECEIVE (READBACK)

T = TRANSMITT

TABLE 1-5

SECTION 2

INSTALLATION

2-1. INTRODUCTION

The Model ADC-5A Analog Digital Control System is tested by The Technical Materiel Corporation in conjunction with a GPTR - 1KC transmitter. It may be used to control any TMC transmitter with the same model number. Adding the system to the transmitter is a relatively simple task. The procedure will be described in this section.

2-2. UNPACKING

All the components of the ADC-5A system including the cabling and mounting hardware are shipped in a single package.

When received at the installation site the equipment should be carefully examined to be sure no damage occured during shipment. All necessary precautions are taken by TMC to minimize shipping hazards. If any such damage is discovered a claim should be filed with the carrier. The Technical Materiel Corporation will assist in rectifying any damage by recommending replacement parts and by describing repair methods.

Do not discard any packing material until all the items on the packing list have been accounted for. It is suggested that the shipping box is a suitable container for transporting the AX5213 Remote Programmer to the control site when initial testing is complete.

2-3. ASSEMBLY

The components of the ADC-5A system become intregal parts of the remotely controlled transmitter system after the assembly and interconnection procedures described in the following paragraphs are complete.

a. AX5190 Decoder. To gain access to the interior of the transmitter remove the rear panel and the second blank panel beneath the SME(R)-5C exciter on the front of the transmitter. Install the four speed nuts supplied, in the inner mounting flange on each side of the opening provided when the blank panel was removed. From the rear of the transmitter, carefully position the decoder unit in the transmitter and secure with the mounting hardware supplied.

CAUTION

Be careful when installing the decoder unit to avoid entanglement with installed wiring.

See figure 2-1 (transmitter interface panel).

The multiple pin plug on the deocder cable mates with jack J203 on the transmitter interface panel. Make this connection.

The AX5190 decoder will operate from a 230 volt AC power source. A multi-socket terminal strip is mounted at the rear of the left (when viewed from the rear of the transmitter) wall of the transmitter cabinet. It is connected to the main power supply of the transmitter (230 vac). Be certain that the selector toggle switch at the rear of the decoder is set in the 230 volt position and plug the power cord into an available socket on the terminal strip.

Connect two pairs of standard 600 ohm transmission lines. One pair will carry the remote control tone signals. These lines should be connected at TB202 (see Table 1-2, Section 1). The second pair of lines are the audio input signals. These lines should be connected at TB201 (see Table 1-2, Section).

When the assembly and electrical connections have been completed replace the panels removed using the original hardware.

b. AX5189 Programmer. The programmer is assemblied at the TMC factory. The final installation therefore is reduced to positioning it conveniently at the remote station, interconnecting it with the transmitter, and providing operating power.

NOTE

It may be expeditious to interconnect the two units of the ADC-5A system temporarily at the transmitter site, and complete an initial operational test at that location.

The remote terminus of the two pairs of signal lines (as mentioned above paragraph a) are as follows: one pair to be connected at the "Datatone" unit marked "XMTR SIG" (see Figure 2-2); The other pair should be terminated also at the "Datatone" unit marked "AUDIO" (See figure 2-2).

The terminus at the transmitter site is the transmitter Interface Panel. A pictorial is shown, Figure 2-1 noting the proper connections.

2-4. INITIAL TEST

Although the ADC-5A system may be checked as an entity, the complexity of such a test operation, and the ease with which the proper operation of the system can be assured when integrated into a transmitter system make such testing unwarranted.

FIGURE 2-2. PROGRAMMER "DATATONE" TERMINATIONS

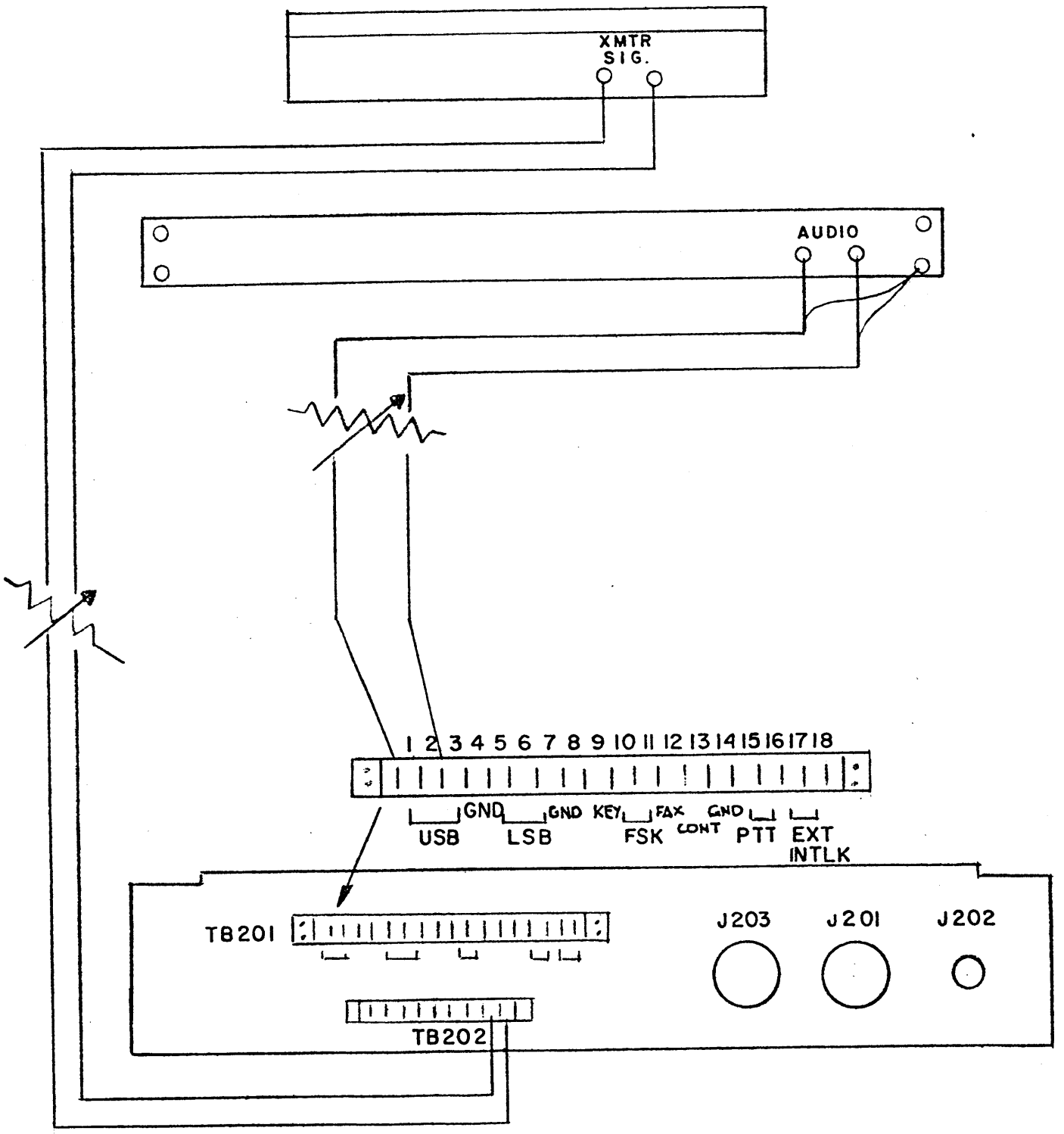


FIGURE 2-1. TRANSMITTER INTERFACE PANEL

The initial test of the ADC-5A system should therefore follow the normal operating procedure given in section 3 of this presentation. However, during initial test, each of the operating modes should be selected and the transmitter tuned to each of the available frequency channels.

2-5. SWITCH FOR HIGH IMPEDANCE OR CARBON MICROPHONE

Either a high or low impedance dynamic microphone or a carbon microphone may be used to provide audio inputs to the transmitter. In the programmer unit AX5213 a 3 position switch is mounted on the printed circuit board (A5650) [See figure 2-3]. This switch is wired to accomodate a carbon, dynamic or a low Z microphone. This is done placing the switch in the position marked on the printed circuit board.

2-6. FINAL INSPECTION

After all electrical connections have been completed the transmitter should be visually inspected to be sure of the following:

a. The interlocks are operable. The interlocks on the GPTR-1KC transmitter are located on the TMA-1KC linear power amplifier unit, and must close when the top and bottom protective covers are secured in place.

b. All electrical connections have been properly made and that the connectors are mechanically secure in the correct positions.

c. The protective top and bottom cover are securely affixed to each modular unit and that the units are secured in the cabinet with panel locks or mounting hardware.

d. The rear cabinet panel is in place and secured with the mounting hardware provided.

e. The antenna system or equivalent dummy load is properly connected to the rf output connector of the transmitter system.

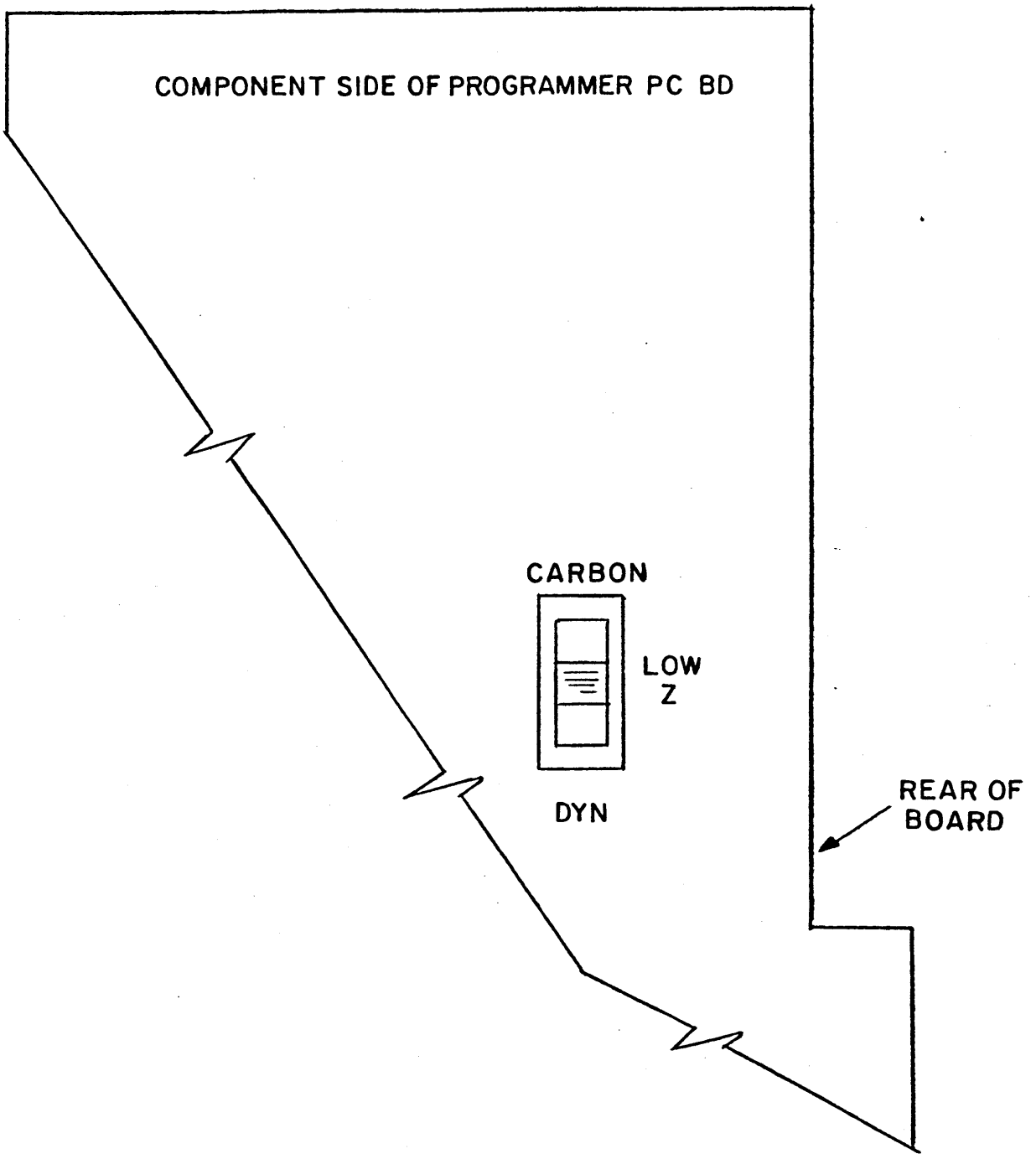


FIGURE 2-3 SWITCH FOR DIFFERENT MICROPHONES

SECTION 3

OPERATOR'S SECTION

3-1. INTRODUCTION

The ADC-5A Analog Digital Control System functions as a pushbutton control unit for an automated high frequency transmitter. Readback indications provide the remote site operator with constant indication of transmitter status. Audio intelligence inputs to the transmitter may be made from the remote station.

3-2. FUNCTIONS

With the use of this system the key operations in the transmitter operating procedure are remotely controlled.

a. Channel Selection. By the use of the CHANNEL selector pushbuttons the remote operator may select any of the available carrier frequencies.

b. Mode Selections. Depressing one of two pushbuttons, AME-SSB the remote operator decides in which mode the transmitter will be operating in.

c. High Voltage Control. The operation of one of two pushbuttons, HIGH VOLTAGE - ON or OFF, enables the remote operator to remove or restore the application of high voltage to the power amplifier tubes of the transmitter.

d. Sideband Selection. Pushbuttons for upper sideband, and lower sideband, program the desired sideband the transmitter will be operating in.

e. Transmitter Readback Indications.

1. HV - When lighted indicates that the high voltage in the transmitter is on.
2. RF - When lighted indicates that the transmitter is putting out an RF Signal.
3. LSB/USB - When lighted indicates which sideband has been selected.

f. Programmer (AX5213) Indications.

1. PWR - When lighted indicates +24VDC is being supplied to the programmer.
2. OVLD - When lighted indicates an overload condition at the transmitter site.
3. PTT - When lighted indicates the PTT circuits have been operated in the system. This will put the transmitter from a standby to an operate mode.

3-3. OPERATING PROCEDURE

Before attempting to operate the ADC-5A system the operators should familiarize themselves with the location of each control and indicator. Only operators throughly knowledgeable and experienced with transmitter operation should use the ADC-5A system.

a. Controls and Indicators. The controls and indicators are located by number on figure 3-1. The list which accompanies the illustration functionally indentifies each of them and serves as an index to the diagram. The programmer controls duplicate those on an exciter and in addition offer a means of remotely controlling the application of high voltage to the plates of the amplifying tubes in the transmitter.

b. Procedural Steps. The ADC-5A system operates only with a correctly functioning remotely controlled transmitter of which it is a part. All interconnections between the transmitter and the remote site from which it is to be controlled must have been properly completed. The following steps will then allow the remote operator to control essential transmitter functions. (Refer to figure 3-1 for index numbers)

NOTE

It is assumed that the transmitter has been energized and properly channelized prior to transferring control to the remote operator.

1. Connect a PTT controlled microphone to the input jack (1). Refer to paragraph 2-5, and figure 2-2 for proper microphone Impedance.

2. Observe the PWR indicator (3) lights.

3. Press the HV-ON pushbutton (23); Observe the high voltage indicator (5) is lighted.

4. Press the HV-OFF pushbutton (19) and observe that the HV-OFF indicator (7) is lighted.

5. Set the mode pushbutton AME (12) or SSB (14) to the desired operating mode. Observe the related light (2) or (13).

6. Set the channel pushbutton CH 1 (20) or CH 2 (21) or CH 3 (22) or CH 4 (24) to the desired channel. The related channel indicator (10) will light.

7. Set the sideband pushbutton USB (17) or LSB (16) as necessary. Observe the related light (18) or (15).

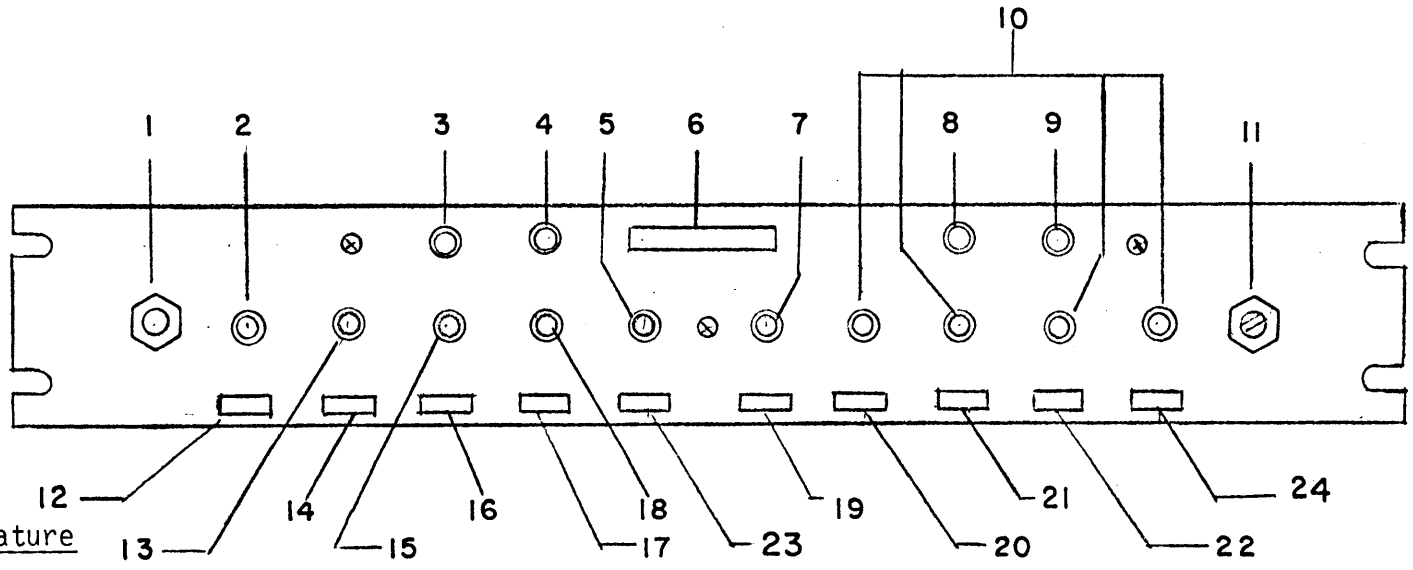
CAUTION

Never press two pushbuttons at the same time.

8. Press the HV-ON (23) pushbutton and note that the HV indicator (5) lights.

9. RF indicator should light in AME. In SSB RF light should follow voice transmission.

10. While providing audio input, adjust the LEVEL (11) control to a level which the transmitter operator indicates does not exceed the average power limit of the transmitter. The indication on the VU meter (6) should be noted at this point, and under normal conditions should not be exceeded.



Nomenclature

Number	Name	Function
1	Input Jack "MIKE"	Provides access for a dry contact key input.
2	LED indicator "AME"	Lights to indicate made "AME"
3	LED indicator "PWR"	Lights to indicate +24VDC is being supplied to the Programmer
4	LED indicator "PTT"	Lights to indicate Push-to-talk circuit is activated
5	LED indicator "HV-ON"	Lights to indicate "HV-ON" has been completed at the transmitter
6	VU meter	Indicates level of intelligence input
7	LED indicator "HV-OFF"	Lights to indicate "HV-OFF" at the transmitter
8	LED indicator "RF"	Indicates transmitter is prepared to transmit intellignece
9	LED indicator "OVLD"	Indicates transmitter has not programmed high voltage on
10	LED indicates "CH1,CH2,CH3,CH4"	Lights to indicate "CH1-CH2-CH3-CH4"
11	Potentiometer - "LEVEL"	Adjust level of audio input
12	Pushbutton "AME"	Initiates tone signals to transmitter selecting mode "AME"
13	LED indicator "SSB"	Lights to indicate mode "SSB"
14	Pushbutton "SSB"	Initiates tone signals to transmitter selecting mode "SSB"
15	LED indicator "LSB"	Lights to indicate "LSB"
16	Pushbutton "LSB"	Initiates tone signal to transmitter selecting "LSB"
17	Pushbutton "USB"	Initiates tone signal to transmitter selecting "USB"
18	LED indicator "USB"	Lights to inidcate "USB"
19	Pushbutton "HV-OFF"	Initiates tone signals to transmitter selecting "HV-OFF"
20	Pushbutton "CH1"	Initiates tone signal to transmitter selecting "CH 1"
21	Pushbutton "CH2"	Initiates tone siganl to transmitter selecting "CH 2"
22	Pushbutton "CH3"	Initiates tone signal to transmitter selecting "CH 3"
23	Pushbutton "HV-ON"	Initiates tone signal to transmitter selecting "HV-ON"
24	Pushbutton "CH4"	Initiates tone signal to transmitter selecting "CH 4"

Figure 3-1. Front Panel - AX5213 Remote Programmer

SECTION 4

PRINCIPLES OF OPERATION

4-1. GENERAL INFORMATION

The remote control of a Technical Materiel Corporation, Model GPTR-1KC transmitter system, is made feasible with the incorporation of the Analog Digital Control System, Model ADC-5A.

The system provides the controls, control signals, and readback indications so that an operator at a remote station some distance from the transmitter site can operate the transmitter as easily as if he were at the transmitter location.

The ADC-5A system consists of two units; A Model AX5213 Remote Programmer and a Model AX5190 Decoder. The later unit mounts directly in the transmitter cabinet. The programmer is of course, located at the remote station. Two standard pairs of 600-ohm transmission lines carry all data and intelligence between the two locations. Section 4 of the technical manual for the transmitter presents a discussion of the overall transmitter operation. This presentation will therefore be confined only to the operation of the remote control system.

4-2. OUTPUT SIGNALS

The outputs generated by the AX5213 programmer are all in the form of tone signals of various frequencies. Each frequency represents a specific bit of an 8-bit binary-type code. Reference to tables 1-1 and 1-3 of this publication will clarify the code bit/frequency relationship.

The control signal outputs of the AX5190 decoder are all ground closures (ground signals). The readback signals generated by the decoder are four specific tone frequencies. These signals HV-ON, RF PWR, LSB, USB, are sent back to the programmer indicating the transmitter status (see Table 1-3 section 1). All of the tone frequency signals are supplied by Datatone modules.

*NOTE

The tone modules were manufactured for The Technical Materiel Corporation by the Trepac Corporation of America to meet TMC specifications. The term Datatone is their registered trade-name.

4-3. SYSTEM OPERATION

In the discussion which follows the operation of the remote programmer will be reviewed first, followed by a circuit analysis on the decoder. Reference to the schematic diagram, figure 4-1, 4-2 will assist the reader in following the signal flow in the programmer. Reference numbers used in the text are those on the diagram.

The signal flow in the decoder may be followed by referring to figure 4-3, 4-4, 4-5 and 4-6 associated with the explanatory text.

a. The Remote Programmer - AX5213

The following paragraphs concern themselves only with the programmer operation.

1) Mode Selection - The desired operating mode is selected by depressing a two pole momentary contact pushbutton. Each mode has its own pushbutton which is marked AME or SSB for exact locations (see Section 3, figure 3-1).

a. AME - By depressing the AME pushbutton (S5). Two simultaneous ground signals are transferred directly to output pin 14 and pin 11 which is interpreted as codes H2 and L3. These codes actuate the related tone frequencies (1336) and (852). Thus the tone frequencies for AME are sent. At the same time a ground is removed from the trigger of (Q10) allowing (Q10) to operate putting a voltage or (high) at terminal 15, which will light the AME LED (DS2) and thus a readout indication.

b. SSB - By depressing the SSB pushbutton (S8) two simultaneous ground signals are transferred directly to output pin 15 and pin 11 which is interpreted as codes H4 and L3. These codes actuate the related tone frequencies (1633) and (852). The tone frequencies now are sent for SSB. At the same time a ground is removed at (Q8) and Q12. Q12 is now allowed to conduct, thereby reseting Q10 extinguishing the AME LED. At Q8 a voltage is placed at it's trigger allowing Q8 to conduct lighting the SSB LED.

2) Channel Selection - The selection circuit for picking the proper channel is accomplished with four (4) two pole monentary contact pushbutton. Each channel has it's own pushbutton. The circuit for each channel is symetrical, only one channel need be explained.

a. Channel one (1) will be used as a typical example.
By depressing the channel one (1) switch (S1) two simultaneous ground signals are transferred directly to output pin 10 and pin 17 which is interpreted as codes H1 and L1. These codes actuate the related tone frequencies (1209) and (697). See Function Code Table 1-3 for codes and related frequencies for Channel 2, 3, and 4. The tone frequencies now are sent for Channel one (1). At the same time a ground is removed at the BASE of Q5 and C10. Q5 is now allowed to conduct reseting the SCR's Q1, Q2, Q3, and Q4, clearing any channel indications that previously appeared. C10 is now allowed to charge. Releasing S1 (out position) allows C10 to discharge, putting a voltage on the trigger of Q1, which allows Q1 to conduct lighting DS1 or the Channel one (1) LED.

3) HV-ON - The HV ON is accomplished by depressing a two pole momentary contact pushbutton.

a. By depressing the HV ON pushbutton (S7) two simultaneous ground signals are trnasferred directly to output pin 14 and pin 10 which is interpreted as codes

H2 and H1. These codes actuate the related tone frequencies (1336) and (1209). The tone frequencies are now sent for HV-ON.

b. The indication for HV-ON is a direct readback from the AX5190 decoder at the transmitter site. A tone (2700) is received at the programmer (AX5213) and a ground or low is initiated. The ground is then transferred to connector pin Z which turns on DS8 or HV-ON LED.

4) HV-OFF - The HV-OFF is accomplished by depressing a two pole momentary contact pushbutton.

a) By depressing the HV-OFF pushbutton (S4) two simultaneous ground signals are transferred directly to output pin 16 and pin 10 which is interpreted as codes H3 and H1. These codes actuate the related tone frequencies (1209) and (1477). The tone frequencies are now sent for HV-OFF. At the same time a ground is removed at the trigger of Q9 which allows C16 to charge, also Q7 is allowed to conduct reseting Q9. Releasing S4 (out position) will prevent Q7 from conducting. Also C16 now will discharge firing Q9 which allows Q9 to conduct putting a high or voltage on the LED DS7, thus a High Voltage off indication.

5) Sideband Selection - The desired sideband is selected by depressing a two pole monentary contact pushbutton. Each sideband has it's own pushbutton which is marked USB and LSB for exact locations (see Section 3, figure 3-1).

a. USB - By depressing the USB pushbutton (S3) two simultaneous ground signals are transferred directly to output pin 19 and pin 17 which is interpreted as codes L4 and L1. These codes actuate the related tone frequencies (697) and (941). The tone frequencies are now sent for USB.

b. LSB - By depressing the LSB pushbutton (S6) two simultaneous ground signals are transferred directly to output pin 11 and pin 17 which is interpreted as codes L3 and L1. These codes actuate the related tone frequencies (852) and (697). The tone frequencies are now sent for LSB.

c. The indication for USB is a direct readback from the AX5190 decoder at the transmitter site. A tone (2500) is received at the programmer AX5213 and a ground or low is initiated. The ground is then transferred to connector Pin 18 which turns on DS9 or USB LED.

d. The indication for LSB is a direct readback from the AX5190 decoder at the transmitter site. A tone (2600) is received at the programmer AX5213 and a ground or low is initiated. The ground is then transferred to connector Pin Y which turns on DS10 or LSB LED.

6) OVLD Indication - In order for a overload indication to appear, a voltage or High must be present at pin Z. This is due to the lack of the tone 2700. The voltage or Hi present at Pin Z is transferred to the base of Q6, causing Q6 to conduct turning the OVLD light on. If Q11 is conducting due to a HV-OFF program, Q6 will not be allowed to conduct keeping the overload light off.

7) RF Indication - In order for a RF indication to appear a Low or ground must be present at Pin X. This is a result of a tone (2800) directly coming back from the transmitter. The tone (2800) accuates a ground or low on Pin X.

8) PWR Indication - A PWR indication will be present when +24V appears at Pin 21. The +24V power supply is generated from a [DATA TONE] module.

A fuse F1 (.3A) is conveniently located on the assembly A5650.

9) PTT Operation - When the push-to-talk switch on the microphone or handset is activated a ground signal is provided to relay K1. Relay K1 has two sets of contacts. The common of each set is grounded. With the contacts activated one set supplied a ground at Pin 20 which activates the tone frequency (770). The second set of contacts sends a ground DS13 LED and lights the indicator.

b. Decoder - AX5190 (at the transmitter site).

The tone signals from the remote site programmer are received at the transmitter where they are directed to the tone receiver section of the decoder. Each tone frequency will activate but one receiver. Two receivers are therefore activated for each command in accordance with the 8-bit code. When activated the receivers provide input signals to three printed circuit boards which support all of the solid-state logic necessary to translate the tone signals to ground output signals to the transmitter. The channel and mode selection are provided by the top or A5656 circuit board. The center board A5653 controls the USB/LSB selection. The bottom board A5662 controls the High Voltage switching and the push-to-talk control.

In the following explanation it will be assumed that the proper tones have been received from the programmer and have activated their like tone receivers.

1) Mode Selection (A5656 Figure 4-3)

a. AME - Tone frequencies (1336) and (852) are received and a voltage or High is placed at Pin D and J of A5656 (Figure 4-3). This results in a low or ground at Pin R which is transferred into the system and the AME circuit is activated.

2) CHANNEL SELECTION

a. Channel 1 Selection - Channel 1 selection differs from channel 2, 3, and 4 in that after it's tone frequencies (1209) and (697) are received and a voltage or High placed at Pin B and H a voltage or High will appear at Pins S, T and U then sent through the system to activate Channel 1. All other channels require one ground or low signal.

b. Channel 2 Selection - Tone frequencies (1336) and (697) are received and a voltage or High is placed at Pins B and J of A5656 (Figure 4-3). This results in a low or ground at Pin S which is transferred into the system and activates Channel 2 circuit.

c. Channel 3 Selection - Tone frequencies (1477) and (697) are received and a Voltage or High is placed at Pins K and B of A5656 (Figure 4-3). This results in a low or ground at Pin T which is transferred into the system and activates channel 3 circuit.

d. Channel 4 Selection - Tone frequencies (1633) and (697) are received and a Voltage or High is placed at Pins L and B of A5656 (Figure 4-3). This results in a low or ground at Pin U which is transferred into the system and activates channel 4 circuit.

3) Sideband Selection A5653 (Figure 4-4)

a. USB - Tone frequencies (697) and (941) are received and a Voltage or High is placed at Pins B and E of A5653 (Figure 4-4). This results in a low or ground at Pin M which is transferred into the system which activates the USB circuit.

b. LSB - Tone frequencies (697) and (852) are received and a Voltage or High is placed at Pins B and D of A5653 (Figure 4-4). This results in a high or voltage at Pin M which is transferred into the system which activates the LSB circuit.

c. USB Readback - A low or ground at Pin R activates the tone (2500). The readback tone now is sent for USB.

d. LSB Readback - A low or ground at Pin P activates the tone (2600). The readback tone now is sent for LSB.

4) HV-ON Selection A5662 (Figure 4-5)

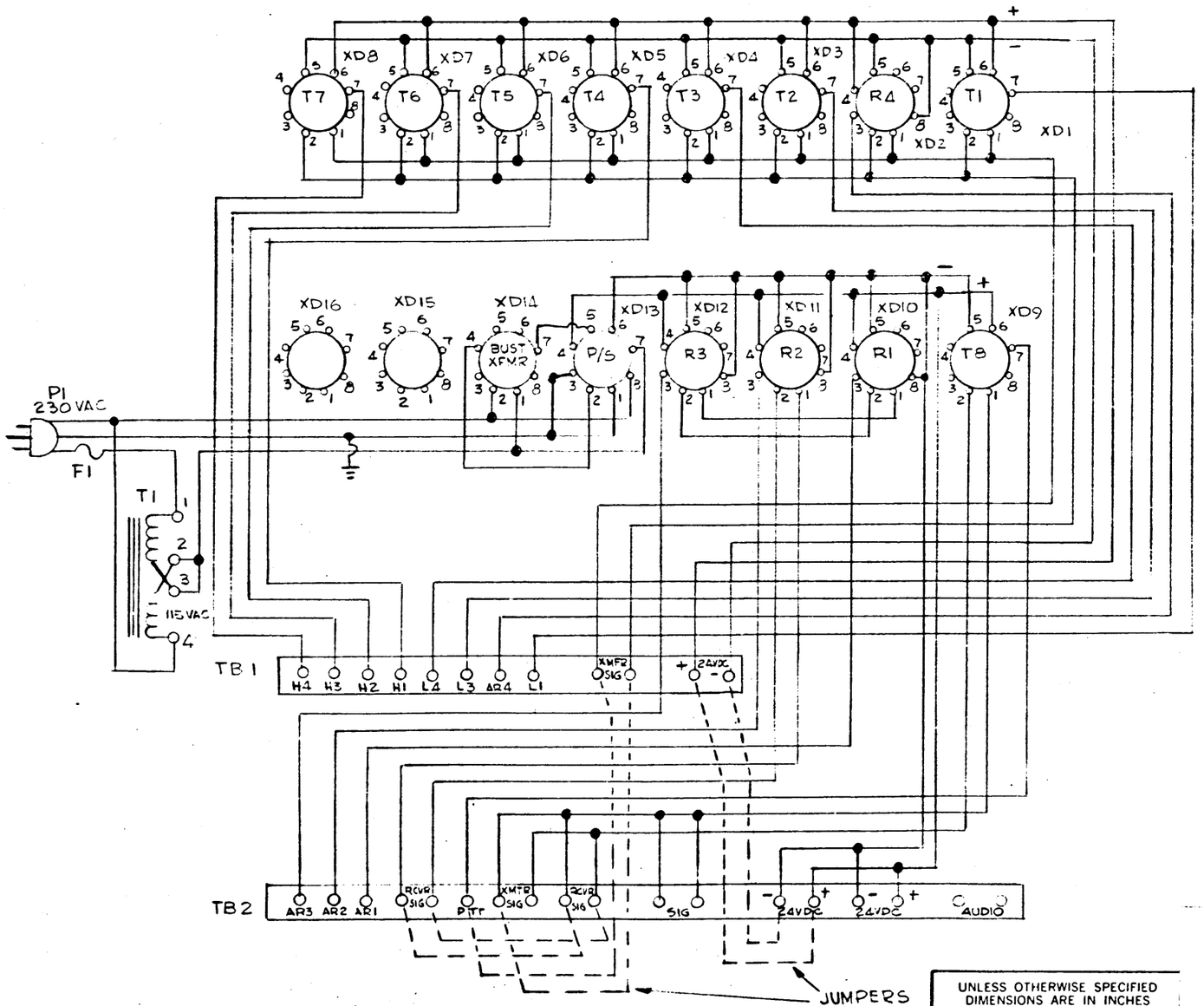
a. HV-ON - Tone frequencies (1209) and (1336) are received and a Voltage or High is placed at Pins E and F of A5662 (Figure 4-5). This allows Q2 to conduct activating the HV relay in the system.

b. HV-ON Readback - When the HV-ON Relay is activated a low or ground is placed on Pin X. This puts a low or ground at Pin Y which activates the tone (2700). The readback tone now is sent for HV-ON.

5) PTT Selection - The tone (770) is received and a high or voltage is placed at Pin K. This will allow Q1 to conduct activating the PTT relay in the system.

6) RF PWR Readback - A low or ground is received from the system and placed on Pin B. Thes causes Pin C to become low or ground activating the tone (2800 Hz). The readback tone now is sent for RF PWR.

REVISIONS							
ZONE	LTR	DESCRIPTION	DATE	E M N NO	DRAFT	CHKD	APPD



CK2149
TONE PROGRAMMER
(REAR VIEW)

1	AX5213	
QTY / UNIT	MODEL USED ON	ASS'Y NO

APPLICATION

CODE

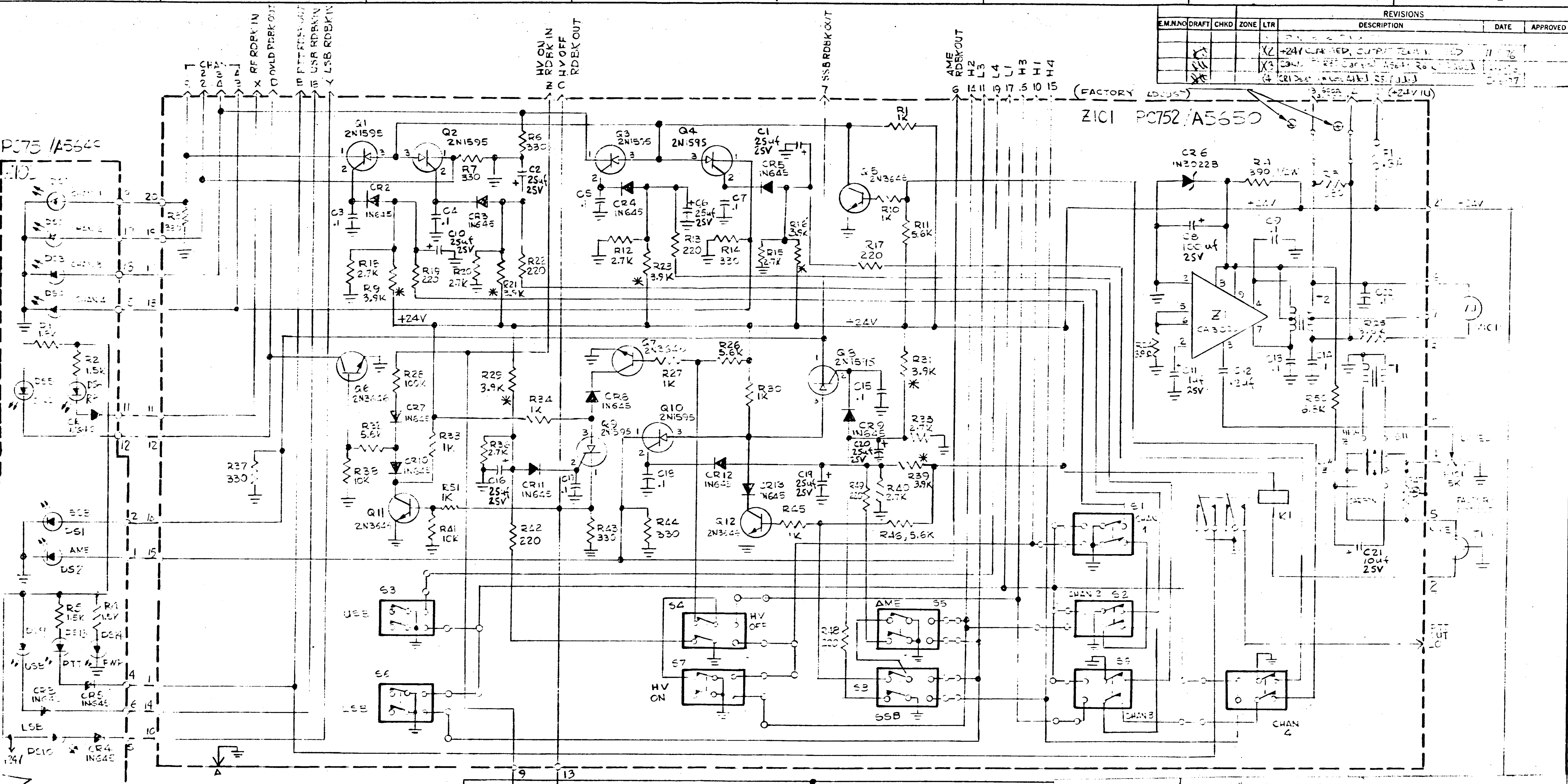
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° 30'

MATERIAL

FINISH



CK2133
SCHEMATIC DIAGRAM
REMOTE PROGRAMMER

A5650	
LAST SYMBOL	MISSING SYMBOL
C22 CR15 K1 Q12 R51 S11 T2	CR1

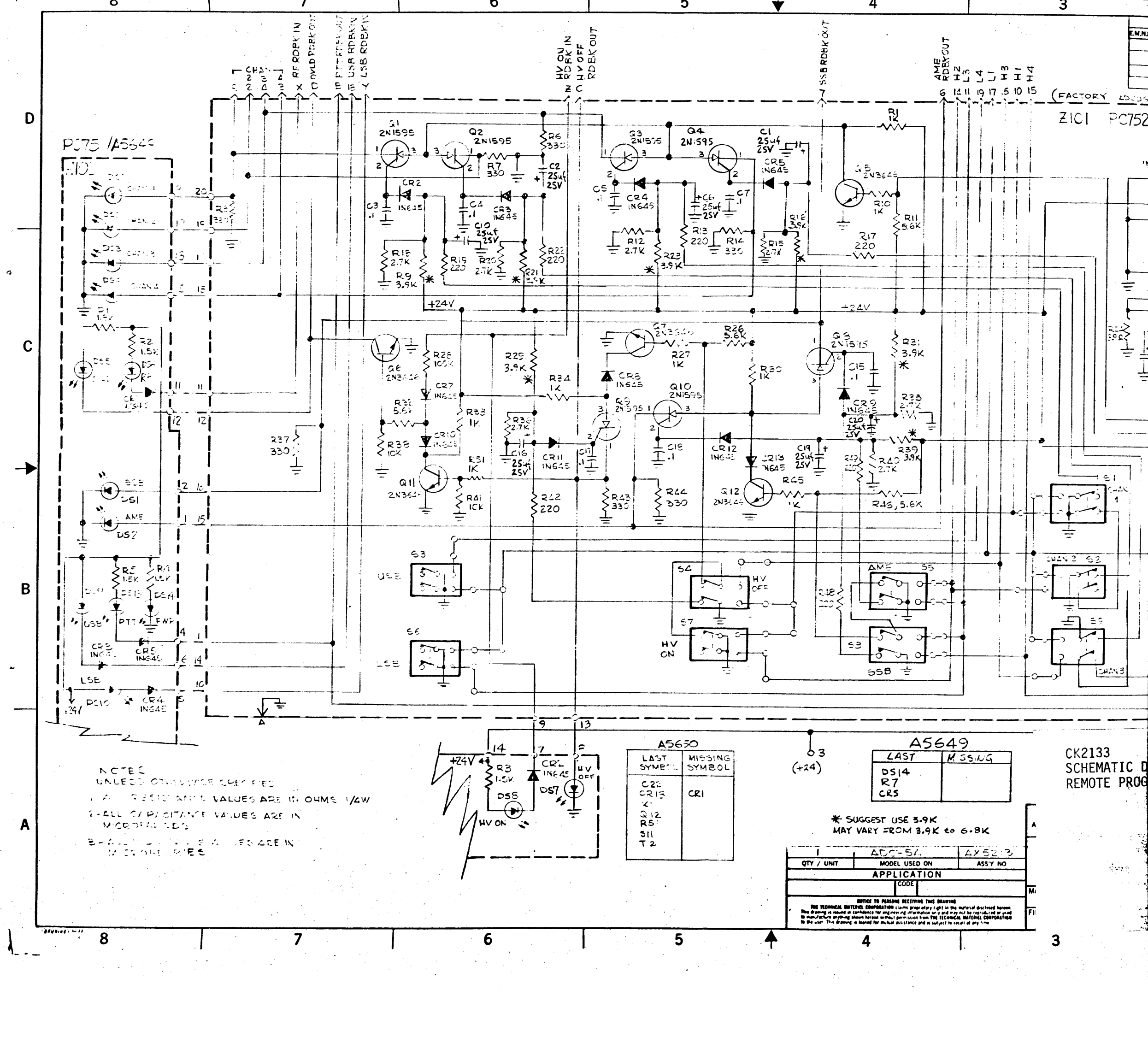
A5649	
LAST	MISSING
DS14 R7 CR5	

* SUGGEST USE 3.9K
MAY VARY FROM 3.9K to 6.8K

NOTES
UNLESS OTHERWISE SPECIFIED
1. ALL RESISTANCE VALUES ARE IN OHMS 1/4W
2. ALL CAPACITANCE VALUES ARE IN MICROFARADS

QTY / UNIT	MODEL USED ON	ASS'Y NO
1	ADC-57	AX52 3

APPLICATION



NOTES
UNLESS OTHERWISE SPECIFIED
1- ALL RESISTANCE VALUES ARE IN OHMS 1/4W
2- ALL CAPACITANCE VALUES ARE IN MICROFARADS
3- ALL [illegible] VALUES ARE IN MICROHENRIES

A5650

LAST SYMBOL	MISSING SYMBOL
C28	
CR15	CR1
K1	
Q12	
R57	
S11	
T2	

A5649

LAST	MISSING
DS14	
R7	
CR5	

* SUGGEST USE 3.9K
MAY VARY FROM 3.9K to 6.8K

QTY / UNIT	MODEL USED ON	ASS'Y NO
1	ADC-5A	AX52-3

APPLICATION

CODE

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CK2133
SCHEMATIC D
REMOTE PROG

REVISIONS							
ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD

PC757/A5656

CHAN(1) IS A PRIORITY CHANNEL
NO PROGRAM OR INCORRECT PROGRAM WILL SET TO CHAN(1)
A(LOW) AT R, PROGRAMS AME
A (HIGH) AT R, PROGRAMS SSB
ANY (LOW) AT S,T,U PROGRAMS CHAN(1) 2,3,4

Z1 (SN7400)
Z2 (SN7410)
Z3 (SN7410)
Z4 SN7404
Z5 (SN7473)
Z6 SN7473
Z7 SN7404

(L1) B
(H1) H
(H2) J
(H3) K
(H4) L
A Z
(L3) D

+5V
GND

C1 .1
C2 .1
C3 .1
C4 .1
C5 .1
C6 .1
C7 .1
C8 .1

AME
SSB

R (AME)
S (CHAN2)
T (CHAN3)
U (CHAN 4)

(REF CARD A)

CK2148
SCHEMATIC DIAGRAM
CHANNEL, MODE PROGRAMMER

QTY / UNIT	MODEL USED ON	ASS'Y NO
1	ADC-5A	AX5190

APPLICATION
CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

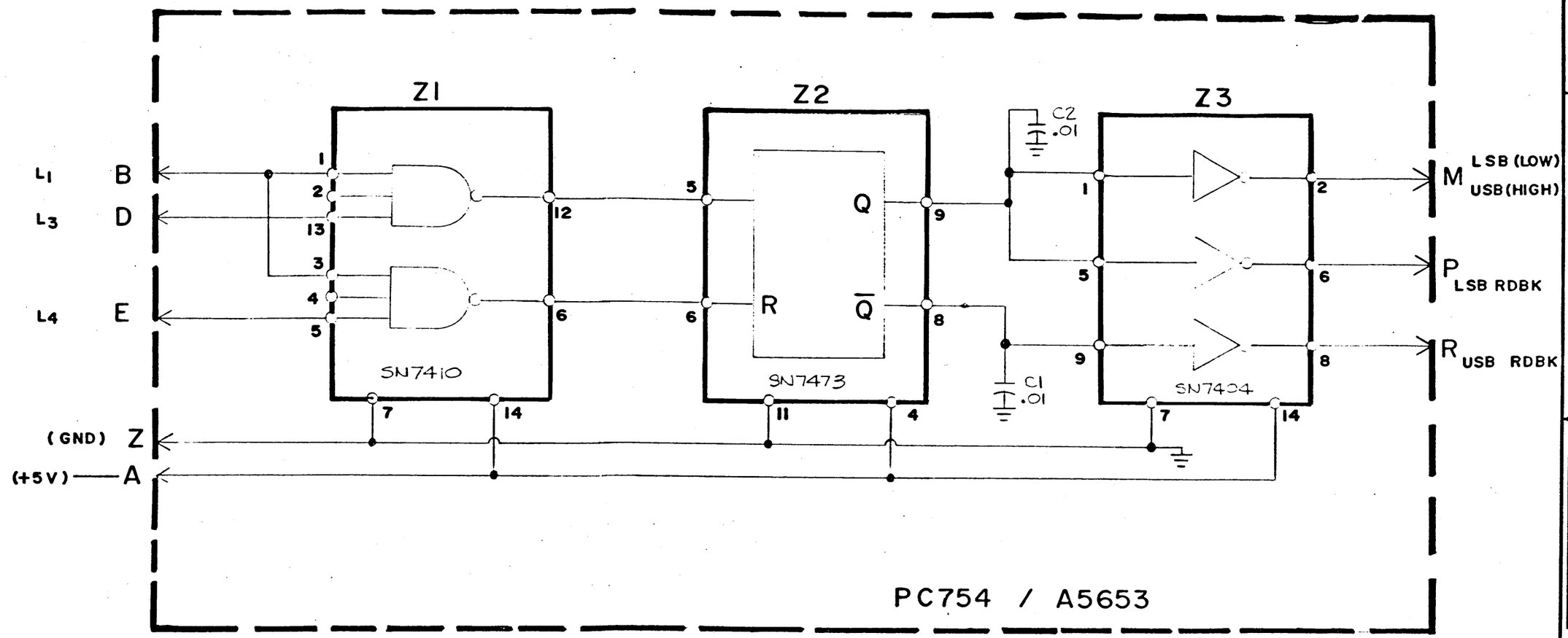
TOLERANCES ON

DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° 30'

MATERIAL

FINISH

REVISIONS							
ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD



*NOTE
FOR CLARIFICATION ONLY THOSE ELEMENTS USED WITHIN THE INTERGRATED CIRCUITS ARE SHOWN

(REF CARD B)

QTY / UNIT	MODEL USED ON	ASS'Y NO.
1	ADC-5A	A5653

APPLICATION

CODE

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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

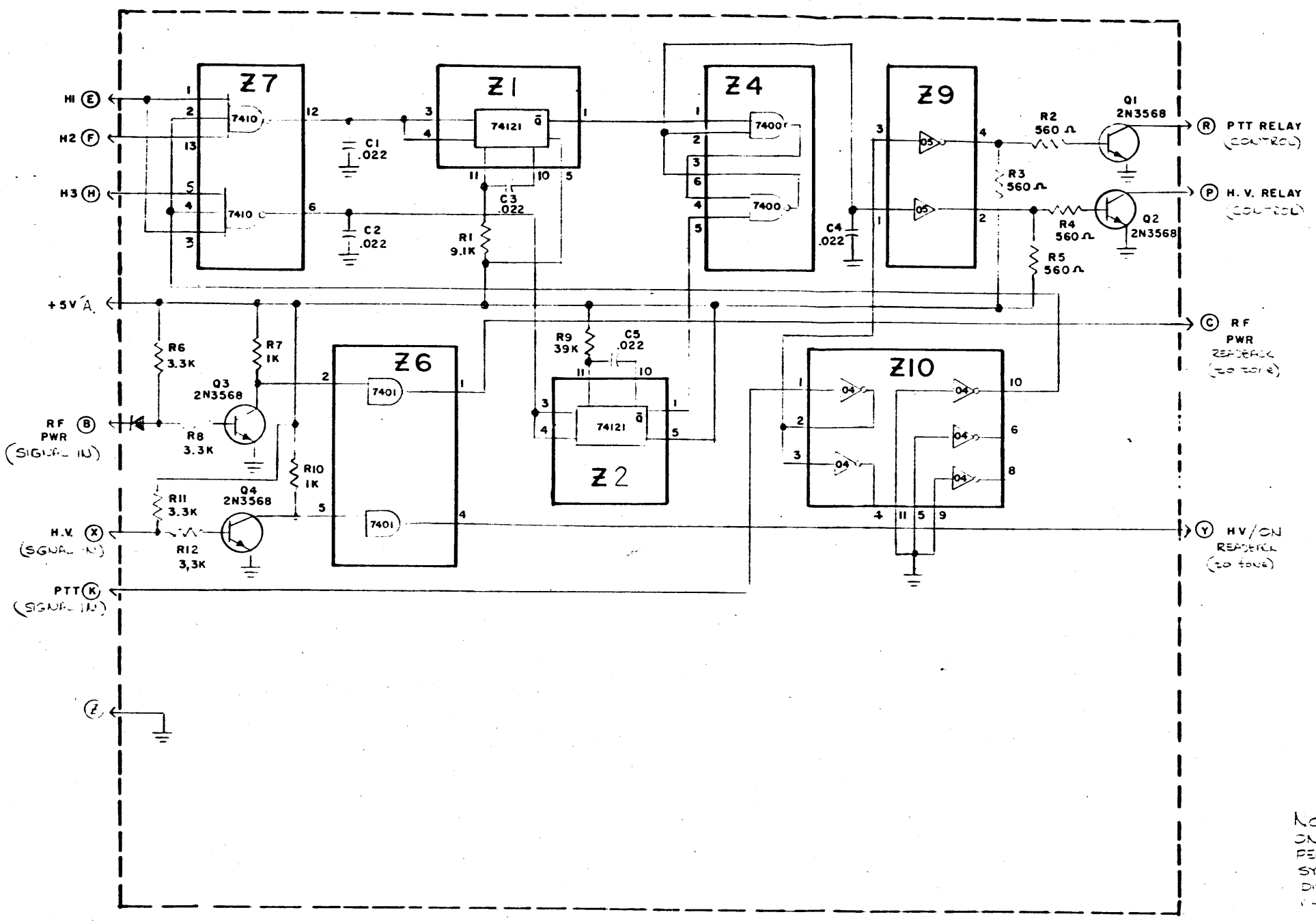
DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0 30'

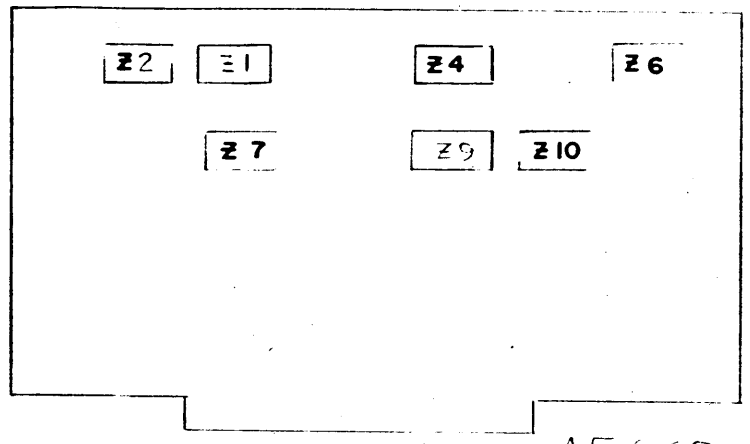
MATERIAL

FINISH

CK2150
USB/LSB CONTROL & READBACK
SCHEMATIC DIAGRAM

REVISIONS					
E.M.N.NO.	DRAFT	CHKD	ZONE LTR	DESCRIPTION	DATE	APPROVED
	KK					
	X2				2-5-[illegible]	





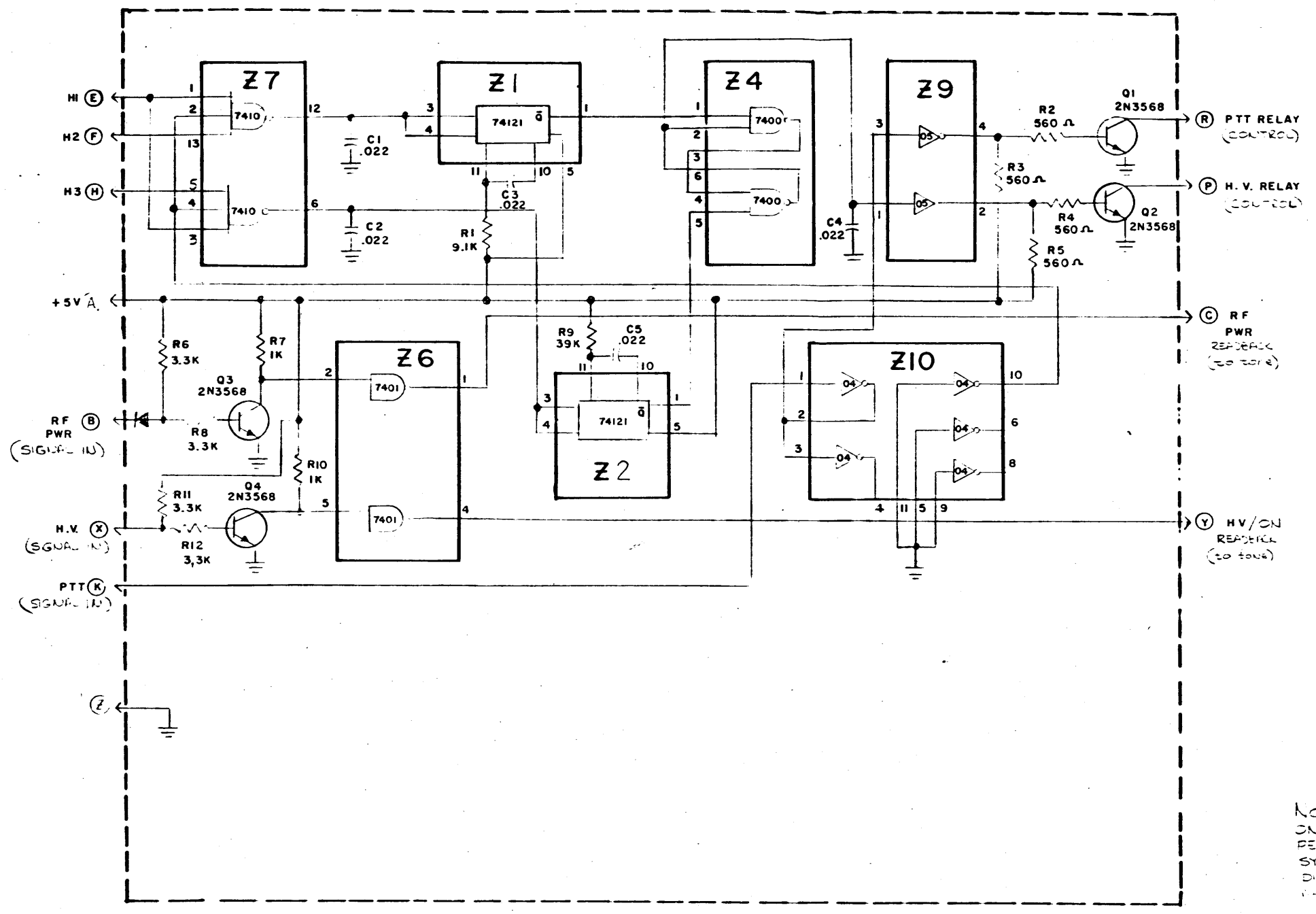
A5662

*NOTE:
PURCHASED FROM (TEPAC)

NOTE
ONLY THOSE CIRCUITS AND COMPONENTS PERTINENT TO THE OPERATION OF THIS SYSTEM ARE SHOWN.
DISREGARD ALL OBSOLETE REFERENCE WHICH MAY APPEAR ON THIS BOARD.

CK2147
SCHEMATIC, DIAGRAM
HV, RF, PTT, CONTROL & READBACK

QTY / UNIT	MODEL USED ON	ASSY NO.
1	ADC-5A	AX5190
APPLICATION		
CODE		



Note
ONLY THOSE CIRCU
PERTINENT TO THE
SYSTEM ARE SHOWN
DISREGARD ALL DE
WHICH MAY APPEAR

CK2147
SCHEMATI
HV, RF,

QTY / UNIT	MODEL USED ON	ASS'Y NO.
1	ADC-5A	AX5190
APPLICATION		
	CODE	

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REVISIONS						
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
					REVISED [illegible] D		

J10

A B C D E F

+5V

GND

LSB/USB CONTROL

J102

A B C D E F H J K L M N P R S T U V W X Y Z

+5V L1 IN L2 IN L3 IN L4 IN H1 IN H2 IN H3 IN H4 IN AME/SSB CHAN 2 CHAN 3 CHAN 4 GND

J103

A B C D E F H J K L M N P R S T U V W X Y Z

+5V L1 IN L2 IN L3 IN L4 IN LSB/USB CONTROL LSB RDBK USB RDBK GND

J104

A B C D E F H J K L M N P R S T U V W X Y Z

+5V RF PWR RF PWR (HI/LO) H1 IN H2 IN H3 IN PTT SIG IN HV ON CONTROL OUT PTT CONTROL OUT GND

TB101

05 MODE
04
03
02
01
00 LSB
CHAN SELECT

TB102

L1
L2
L3
L4
H1
H2
H3
H4
+24V
RC/R SS

TB103

RC/R SS
XMTR SIG
COM
RF PWR
H1 IN
LSB RDBK
PTT
H1

TB104

L1
L3
L4
H1
H2
H3
H4
+24V
RC/R SS
XMTR SIG
XCVR SS
C
C

+5V REG.

-5VDC

H4 (FREQ) 1633

H3 (FREQ) 1477

H2 (FREQ) 1336

H1 (FREQ) 1209

L4 (FREQ) 941

L3 (FREQ) 852

USB/RB (FREQ) 2500

LI (FREQ) 697

+24V

RF/RB PWR FREQ 2800

HV ON/RB FREQ 2700

LSB/RB (FREQ) 2600

PTT (FREQ) 770

P101

CK2146
SCHEMATIC, DIAGRAM
OVERALL DECODER WIRING

QTY / UNIT	MODEL USED ON	ASS'Y NO
1	ADC-5A	AX5190
APPLICATION		
CODE		

SECTION 5

MAINTENANCE

5-1. GENERAL INFORMATION

Care in the operation of the ADC-5A Analog Digital Control System, will enhance the reliability built into the system and contribute to long periods of trouble-free service. The system operates at a low power level and component stress is minimal in normal operation. Daily care should be provided to prevent the accumulation of dust and dirt and eliminate any grease or grime which might degrade equipment appearance or performance.

5-2. PREVENTIVE MAINTENANCE

Those actions which are taken on a regularly scheduled basis to reduce to a minimum the loss if equipment availability due to failure may be considered preventive maintenance. In this category are such procedures as cleaning, inspection and minor repair.

a. Cleaning - The external surfaces of the units should be free of contamination at all times. Greasy substances may be removed with any good dry cleaning solvent, but adequate ventilation must be provided.

The internal components should be cleaned on a weekly basis during the regular inspection. Dust may be removed from printed circuit boards and terminals with a soft brush or low pressure (under 20 psi) compressed air.

b. Inspection - A thorough visual inspection conducted at least weekly is recommended as a practical means of preventing trouble before it occurs. All of the components and wiring should be examined for evidence of deterioration. Connections and terminal boards should be checked for security. If corrosion, charring, discoloration or grease is evident, the condition should be corrected by cleaning or replacing the component. Any loose connectors or connections should be tightened. Broken, cracked, or frayed wiring should be replaced.

c. Minor Repair - Repair procedures which do not make extensive testing mandatory, may be considered minor. Replacing defective components on the modular or pc level is an example of such a procedure, as is tightening loose electrical or mechanical connections. When replacing any component only the same or electrically equivalent parts should be used. Section 6 of this manual presents a list of components by part number and should be consulted when repairs are being made.

5-3. CORRECTIVE MAINTENANCE

In the event of a major malfunction, standard trouble shooting techniques should enable a competent technician to locate the problem, determine the cause, and take the necessary corrective action. No special tools are required to service the ADC-5A system. A standard volt/ohm meter such as a Simpson, Model 260, will be found useful, and an oscilloscope such as a Tektronix, Model 541A, and a VTVM (Ballantine, Model 314), may be of assistance in tracing the tone frequency circuits.

SECTION 6

PARTS LIST

The parts lists presented in this section provide a cross reference between the reference designation of the part and the TMC part number. The reference designation is used to identify a part on assembly drawings and schematic diagrams. Wherever practical, they are also marked on the equipment adjacent to the part.

The letter of the reference designator identifies the generic group to which the part belongs; eg: resistor (R), capacitor (C), switch (S).

Complete identification will expedite delivery when ordering renewal parts. The following information should be given for each part:

Description
*Reference designation
TMC part number
*Assembly number
Equipment model number
Equipment serial number

This information is available from the equipment nameplate, and the parts lists in this section.

To simplify the task of ordering renewal parts, an order form has been included at the end of this section. The information requested in the preceding list which has been marked with an asterisk should be included in the description column.

ANALOG DIGITAL CONTROL SYSTEM

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
J101	JACK	JJ033
M101	METER	MR191-8
R101	RESISTOR, VAR	RV4NAYSD502A
J102	CONNECTOR, P.C. BOARD	JJ31922DFE
Z101	OVERALL ASSEMBLY	A5650
Z102	INDICATOR, ASSEMBLY	A5649
	AX519 (Decoder)	
Z101	CHANNEL, MODE, ASSEMBLY	A5656
Z102	LSB/USB ASSEMBLY	A5653
Z103	HV ON, OFF ASSEMBLY	A5662

Z101
OVERALL ASSEMBLY (A5650)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1	CAPACITOR, FIXED, ELECTROLYTIC	CE105-25-25
C2	SAME AS C1	
C3	CAPACITOR, FIXED, CERAMIC	CC131-39
C4	SAME AS C3	
C5	SAME AS C3	
C6	SAME AS C1	
C7	SAME AS C3	
C8	CAPACITOR, FIXED, ELECTROLYTIC	CE105-100-25
C9	SAME AS C3	
C10	SAME AS C1	
C11	CAPACITOR, FIXED, ELECTROLYTIC	CE105-1-25
C12	CAPACITOR, FIXED, CERAMIC	CC100-33
C13	SAME AS C3	
C14	SAME AS C3	
C15	SAME AS C3	
C16	SAME AS C1	
C17	SAME AS C3	
C18	SAME AS C3	
C19	SAME AS C1	
C20	SAME AS C1	
C21	CAPACITOR, FIXED, ELECTROLYTIC	CE105-10-25
C22	SAME AS C3	
CR1 thru CR5	SEMICONDUCTOR, DEVICE, DIODE	IN645
CR6	SEMICONDUCTOR, DEVICE, DIODE	IN3022B
CR7 thru CR14	SEMICONDUCTOR, DEVICE, DIODE	IN645
F1	FUSE, CARTRIDGE	FU102-.3
K1	RELAY	RL156-14
Q1 thru Q4	TRANSISTOR	2N1595
Q5 thru Q7	TRANSISTOR	2N3646
Q8 thru Q10	TRANSISTOR	2N1595
Q11	TRANSISTOR	2N3646
Q12	SAME AS Q5	
R1	RESISTOR, FIXED, COMPOSITION	RC07GF102J
R2	RESISTOR, FIXED, COMPOSITION	RC07GF561J
R3	SAME AS R2	
R4	RESISTOR, FIXED, COMPOSITION	RC07GF391J

Z101
OVERALL ASSEMBLY (A5650)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
R5	RESISTOR, FIXED, COMPOSITION	RC07GF681J
R6	RESISTOR, FIXED, COMPOSITION	RC07gF331J
R7	SAME AS R6	
R8	SAME AS R6	
R9	RESISTOR, FIXED, COMPOSITION	RC07GF682J
R10	SAME AS R1	
R11	RESISTOR, FIXED, COMPOSITION	RC07GF562J
R12	RESISTOR, FIXED, COMPOSITION	RC07GF272J
R13	RESISTOR, FIXED, COMPOSITION	RC07GF221J
R14	SAME AS R6	
R15	SAME AS R12	
R16	SAME AS R9	
R17	SAME AS R13	
R18	SAME AS R12	
R19	SAME AS R13	
R20	SAME AS R12	
R21	SAME AS R9	
R22	SAME AS R13	
R23	SAME AS R9	
R24	RESISTOR, FIXED, COMPOSITION	RC07GF392J
R25	RESISTOR, FIXED, COMPOSITION	RC07GF362J
R26	SAME AS R11	
R27	SAME AS R1	
R28	RESISTOR, FIXED, COMPOSITION	RC07GF104J
R29	SAME AS R9	
R30	SAME AS R1	
R31	SAME AS R9	
R32	SAME AS R11	
R33	SAME AS R1	
R34	SAME AS R1	
R35	SAME AS R12	
R36	SAME AS R12	
R37	SAME AS R6	
R38	RESISTOR, FIXED, COMPOSITION	RC07GF103J
R39	SAME AS R9	
R40	SAME AS R12	
R41	SAME AS R38	
R42	SAME AS R13	
R43	SAME AS R6	
R44	SAME AS R6	
R45	SAME AS R1	
R46	SAME AS R11	
R47	NOT USED	
R48	SAME AS R13	
R49	SAME AS R13	
R50	SAME AS R9	

Z101
OVERALL ASSEMBLY (A5650)

REF SYMBOL	DESCRIPTION	TMC PART NUMBER
S1 thru S10	SWITCH	SW563
S11	SWITCH, SLIDE	SW552
T1	TRANSFORMER	TF246-6X
T2	TRANSFORMER	TF248

Z102
INDICATOR ASSEMBLY (A5649)

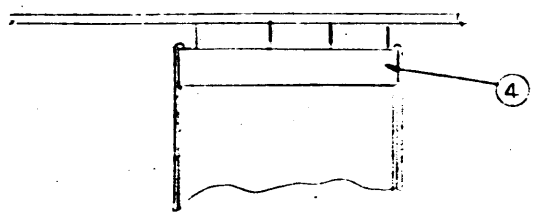
REF SYMBOL	DESCRIPTION	TMC PART NUMBER
CR1 thru CR5	SEMICONDUCTOR, DEVICE, DIODE	IN645
DS1 thru DS14	LIGHT, EMITTING DIODE	BI132
R1	RESISTOR, FIXED, COMPOSITION	RC07GF182J
R2 thru R7	RESISTOR, FIXED, COMPOSITION	RC07GF152J

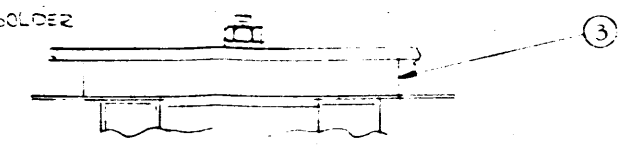
LSB/USB CONTROL, ASSEMBLY
(A5653)

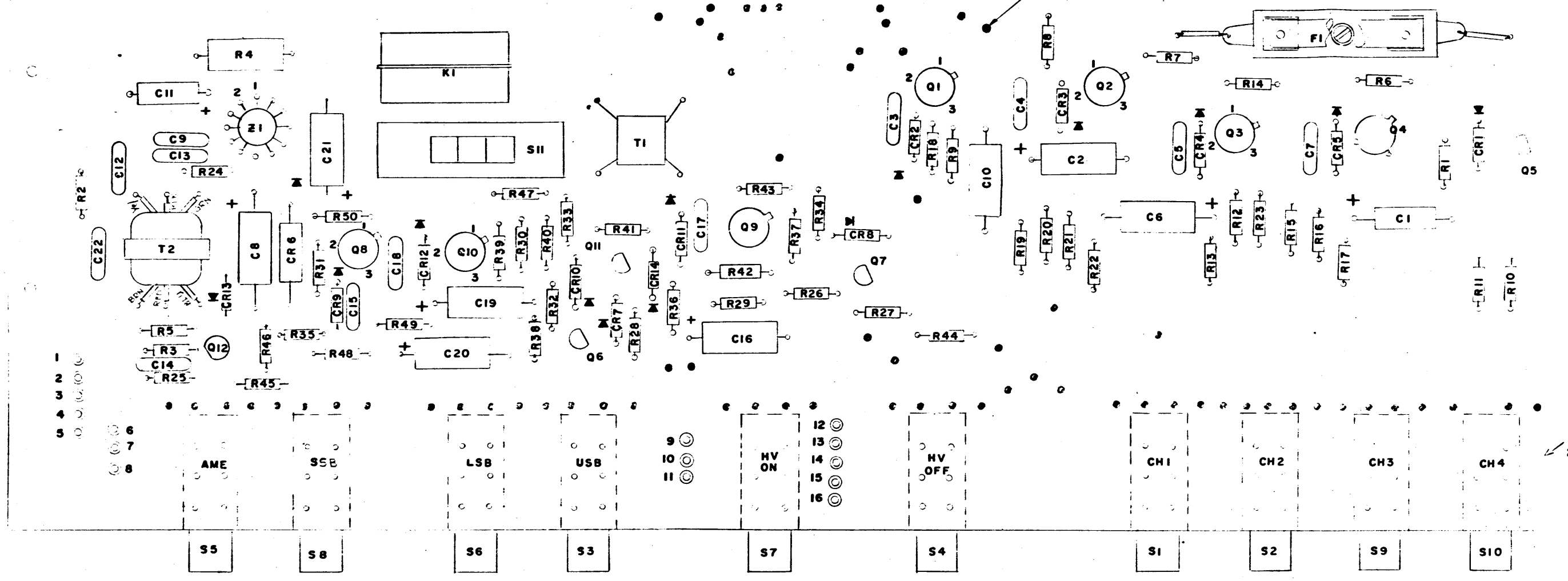
REF SYMBOL	DESCRIPTION	TMC PART NUMBER
C1	CAPACITOR, FIXED, CERAMIC	CC100-41
C2	SAME AS C1	
Z1	MICRICIRCUIT, DIGITAL	NW199
Z2	MICROCIRCUIT, DIGITAL	NW159
Z3	MICROCIRCUIT, DIGITAL	NW187
	CHANNEL, MODE ASS'Y A5656	
C1 thru C8	CAPACITOR, FIXED, CERAMIC	CC131-39
Z1	MICROCIRCUIT, DIGITAL	NW176
Z2	MICROCIRCUIT, DIGITAL	NW199
Z3	SAME AS Z2	
Z4	MICROCIRCUIT, DIGITAL	NW187
Z5	MICROCIRCUIT, DIGITAL	NW159
Z6	SAME AS Z5	
Z7	SAME AS Z4	
	HV ON/OFF ASSY. A5662	
C1	CAPACITOR, FIXED, CERAMIC	CC131-39
C2	SAME AS C1	
C3	SAME AS C1	
C4	SAME AS C1	
C5	SAME AS C1	
R2	RESISTOR, FIXED, COMPOSITION	RC07GFS61J
R3	SAME AS R2	
R4	SAME AS R2	
R5	SAME AS R2	

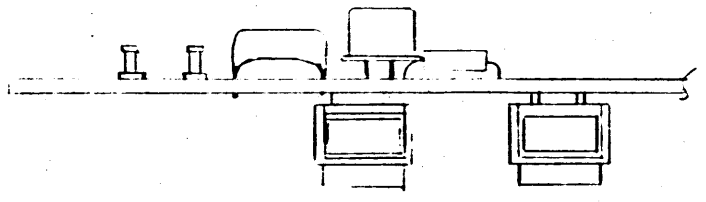
REF SYMBOL	DESCRIPTION	TMC PART NUMBER
	CONTINUED, A5662	
R6	RESISTOR, FIXED, COMPOSITION	RC07GF332J
R7	RESISTOR, RIXED, COMPOSITION	RC07GF102J
R8	SAME AS R6	
R9	RESISTOR, FIXED, COMPOSITION	RC07GF393J
R10	SAME AS R7	
R11	SAME AS R6	
R12	SAME AS R6	
Q1	TRANSISTOR	2N3568
Q2	SAME AS Q1	
Q3	SAME AS Q1	
Q4	SAME AS Q1	
Z1	MICROCIRCUIT, DIGITAL	SN74121
Z2	SAME AS Z1	
Z4	MICROCIRCUIT, DIGITAL	NW176
Z6	MICROCIRCUIT, DIGITAL	NW167
Z7	MICROCIRCUIT, DIGITAL	NW199
Z9	MICROCIRCUIT, DIGITAL	SN7405
Z10	MICROCIRCUIT, DIGITAL	NW159

REVISIONS						
E.M.N.NO	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
				X	PC REV. CHG.		









ASSEMBLY NOTES

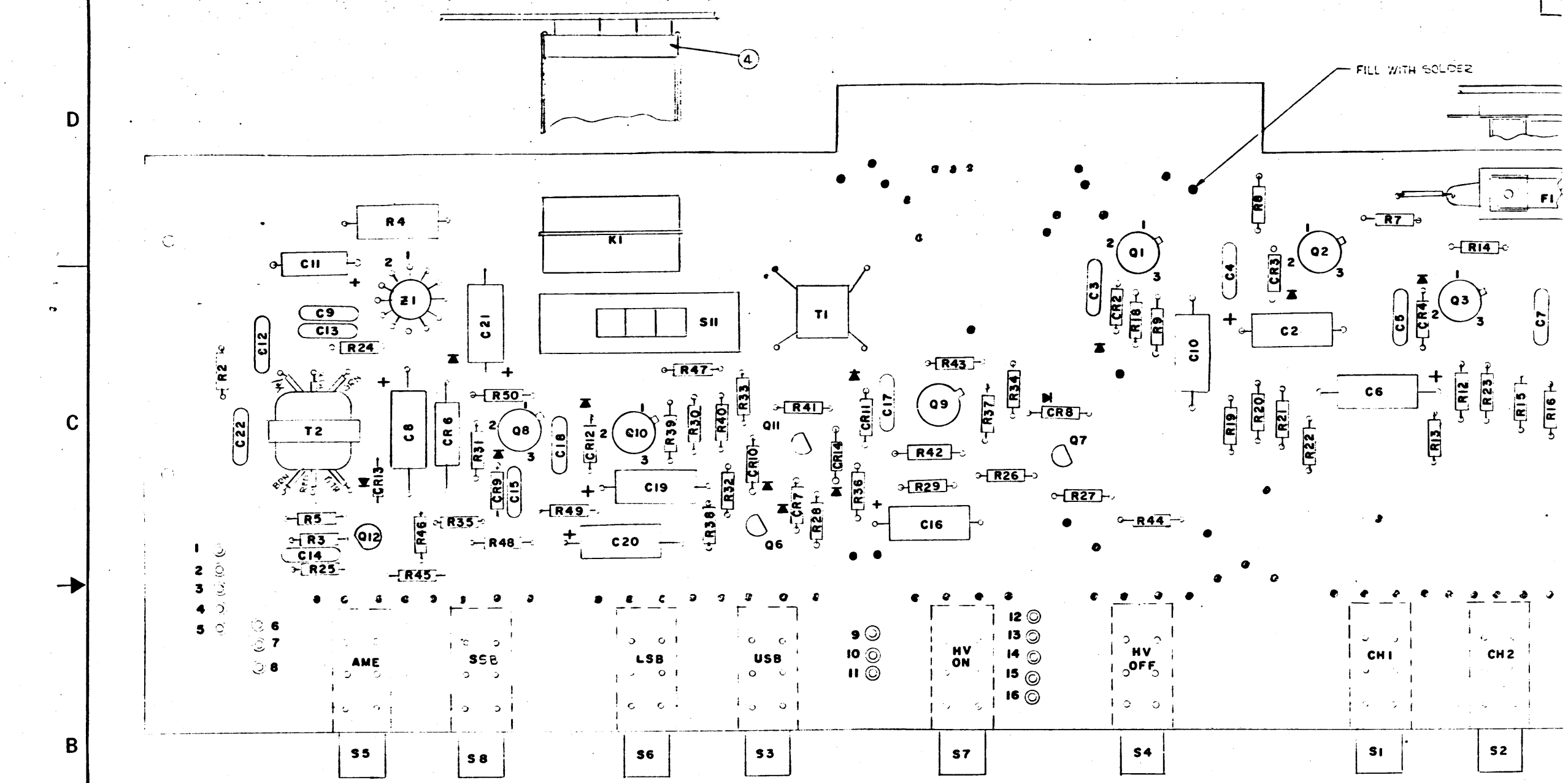
1. TO MOUNT COMPONENTS INSERT LEADS THROUGH HOLES.
2. CAUTION, WHEN APPLYING HEAT & SOLDER TO LEAD & FOIL.
3. CLEAN & INSPECT AS PER SPEC S676.
4. FOR ELECTRICAL COMPONENT PART NUMBERS REFER TO NPL A
5. USE SYMBOL NUMBERS FOR ASSY. REF.

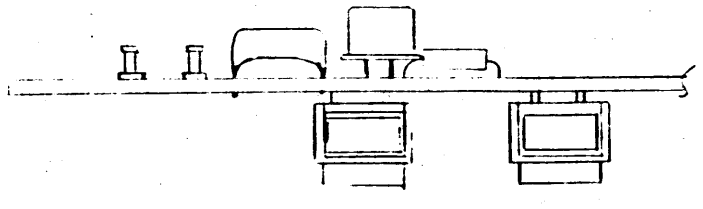
1	LDC-5A	AXS2 3
QTY / UNIT	MODEL USED ON	ASS'Y NO

APPLICATION

CODE

A5650
ASS'Y PRINTED CIRCUIT BD.
REMOTE PROGRAMMER





ASSEMBLY NOTES

1. TO MOUNT COMPONENTS INSERT LEADS THROUGH HOLES.
2. CAUTION, WHEN APPLYING HEAT & SOLDER TO LEAD & FOIL.
3. CLEAN & INSPECT AS PER SPEC S676.
4. FOR ELECTRICAL COMPONENT PART NUMBERS REFER TO NPL A
5. USE SYMBOL NUMBERS FOR ASSY. REF.

REF: CK2133

QTY / UNIT	MODEL USED ON	ASSY NO
1	LDC-5A	AX523

APPLICATION

CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

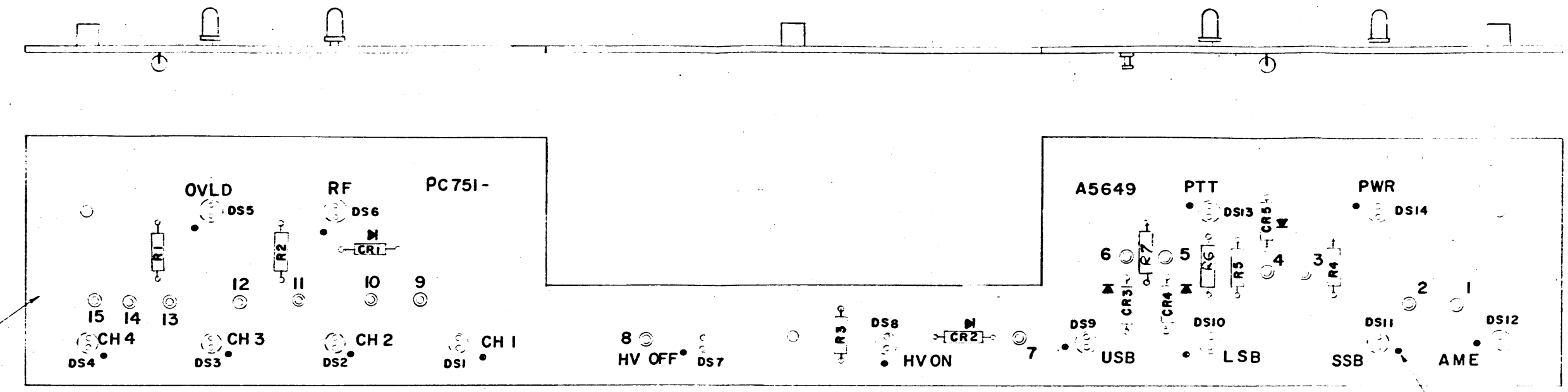
TOLERANCES ON

DECIMALS	FRACTIONS
X ± .05	± 1/64
XX ± .01	ANGLES
XXX ± .005	± 0° 30'

MATERIAL

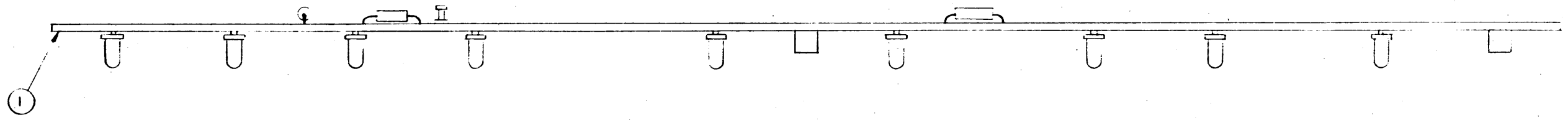
FINISH

REVISIONS						
E.M.N.O.	DRAFT	CHKD	ZONE	LTR	DESCRIPTION	DATE	APPROVED
~	[illegible]			X1	[illegible]		



— FILL W. TH SOLDER

NT COMPONENTS
T SIDE

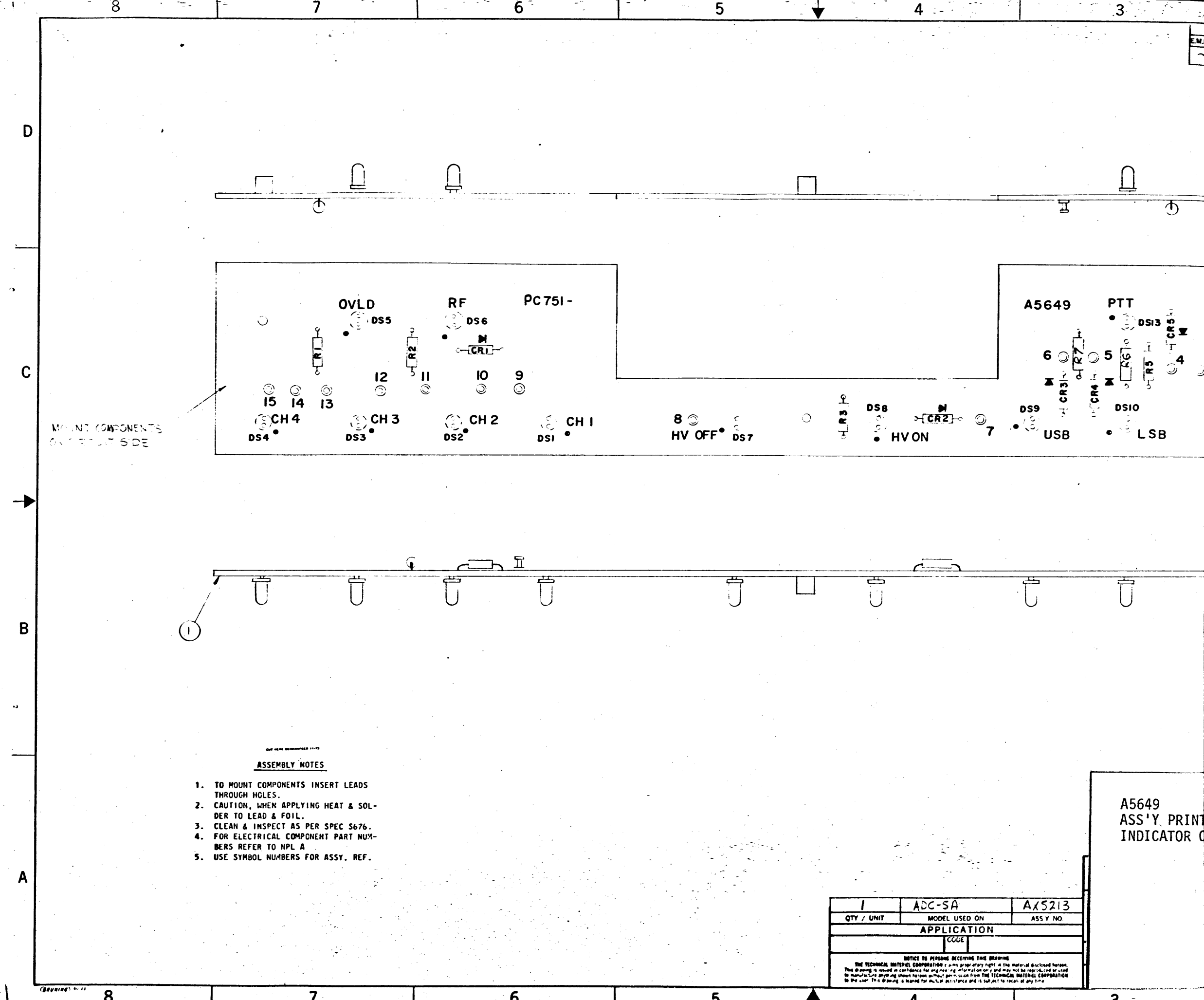


ASSEMBLY NOTES

1. TO MOUNT COMPONENTS INSERT LEADS THROUGH HOLES.
2. CAUTION, WHEN APPLYING HEAT & SOLDER TO LEAD & FOIL.
3. CLEAN & INSPECT AS PER SPEC S676.
4. FOR ELECTRICAL COMPONENT PART NUMBERS REFER TO NPL A
5. USE SYMBOL NUMBERS FOR ASSY. REF.

1	ADC-SA	AX5213
QTY / UNIT	MODEL USED ON	ASS'Y NO
APPLICATION		
	CODE	

A5649
ASS'Y PRINTED CIRCUIT BD.
INDICATOR CIRCUIT


8
7
6
5
4
3
D
C
B
A
OVLD
DS5
RF
DS6
PC751-
CR1
R1
R2
12
11
10
9
15
14
13
CH4
DS4
CH3
DS3
CH2
DS2
CH1
DSI
8
HV OFF
DS7
R3
DS8
HV ON
CR2
7
DS9
USB
DSI0
LSB
A5649
PTT
DSI3
CR5
6
5
4
R7
R6
R5
CR3
CR4
MOUNT COMPONENTS
ON THIS SIDE
1
ASSEMBLY NOTES
1. TO MOUNT COMPONENTS INSERT LEADS THROUGH HOLES.
2. CAUTION, WHEN APPLYING HEAT & SOLDER TO LEAD & FOIL.
3. CLEAN & INSPECT AS PER SPEC S676.
4. FOR ELECTRICAL COMPONENT PART NUMBERS REFER TO NPL A
5. USE SYMBOL NUMBERS FOR ASSY. REF.
A5649
ASS'Y PRINT
INDICATOR C
1
QTY / UNIT
ADC-SA
MODEL USED ON
AX5213
ASS'Y NO
APPLICATION
CODE
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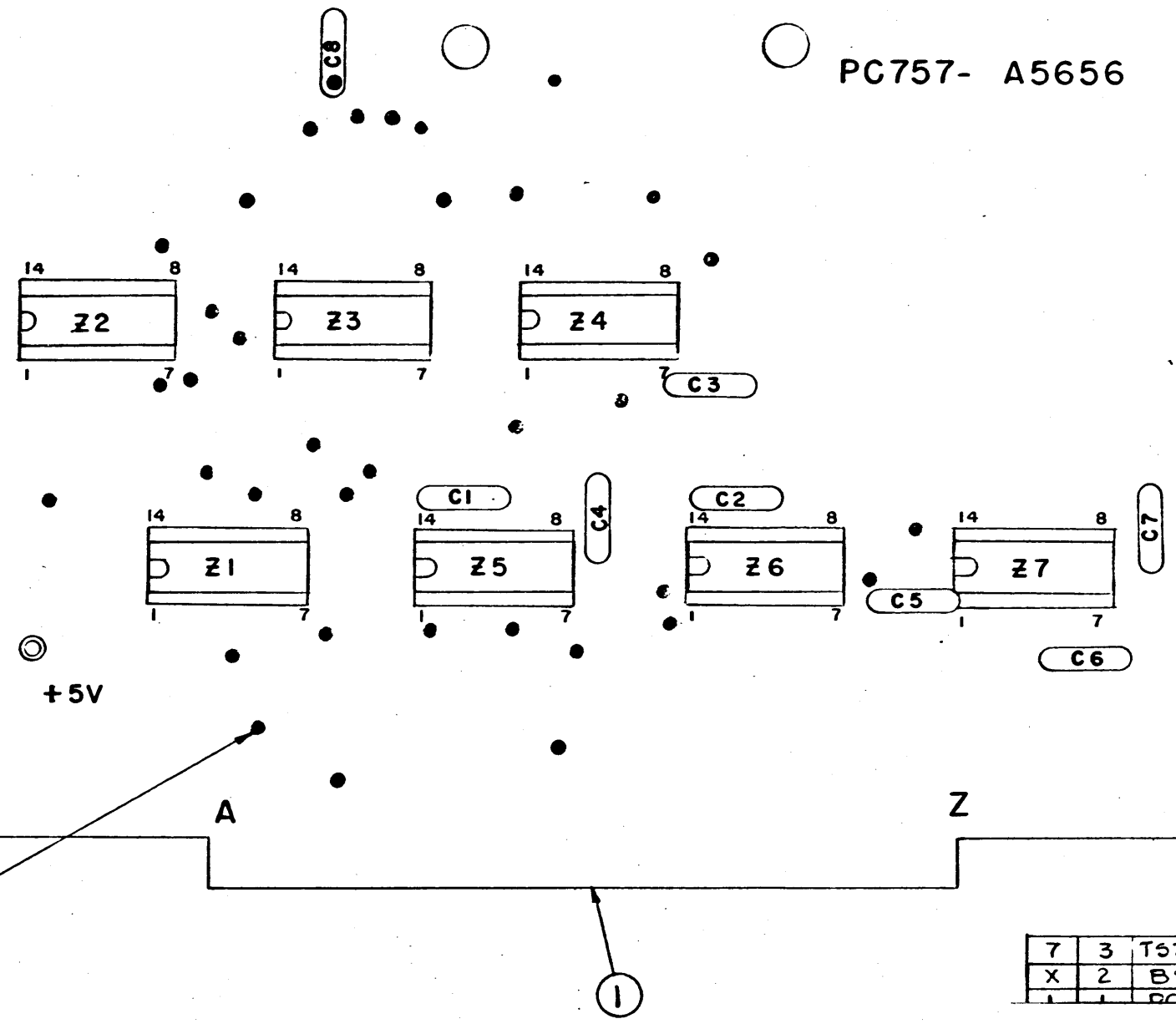
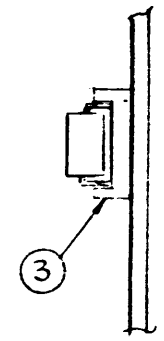
REVISIONS							
ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD

PC757- A5656





7	3	T5211-1	SOCKET, 14 PINS I.C. XZ1 XZ2 XZ3 XZ4 XZ5 XZ6 XZ7
X	2	BS100	SOLDER TIN ALLOY
1	1	PC757	PRINTED CIRCUIT BOARD

REF: CK2148

A5656
ASS'Y PRINTED CIRCUIT BD.
CHANNEL & MODE

ASSEMBLY NOTES

1. TO MOUNT COMPONENTS INSERT LEADS THROUGH HOLES.
2. CAUTION, WHEN APPLYING HEAT & SOLDER TO LEAD & FOIL.
3. CLEAN & INSPECT AS PER SPEC S676.
4. FOR ELECTRICAL COMPONENT PART NUMBERS REFER TO NPL A
5. USE SYMBOL NUMBERS FOR ASSY. REF.

1	ADC-5A	AX5190
QTY / UNIT	MODEL USED ON	ASS'Y NO

APPLICATION

CODE

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

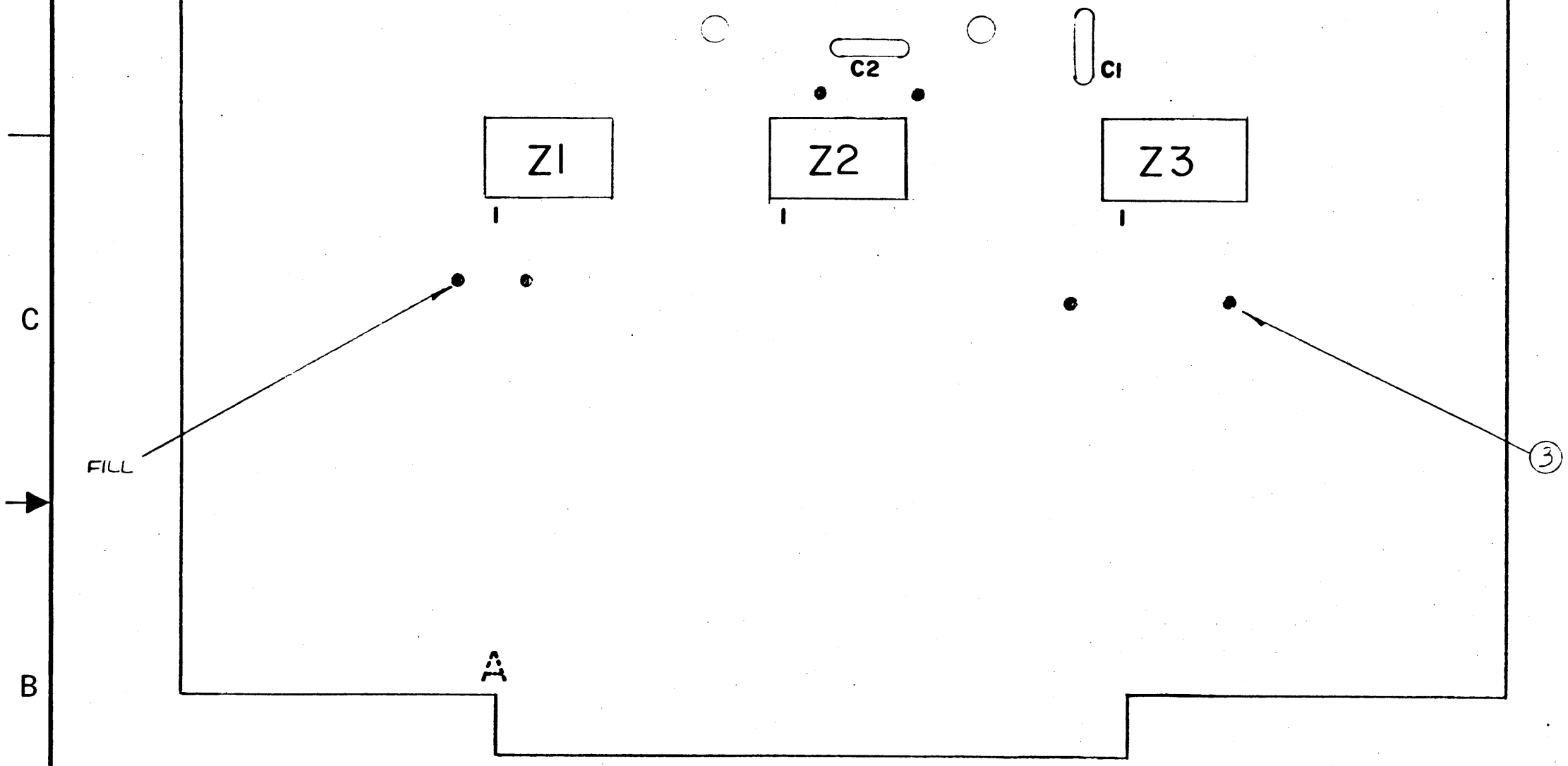
DECIMALS	FRACTIONS
.X ± .05	± 1/64
.XX ± .01	ANGLES
.XXX ± .005	± 0° 30'

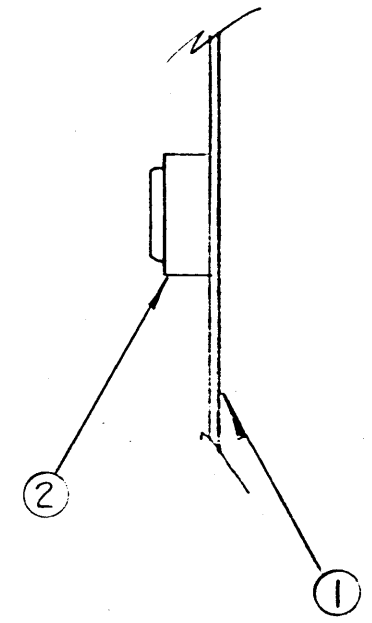
MATERIAL

FINISH

6-11

REVISIONS							
ZONE	LTR	DESCRIPTION	DATE	E M N.NO	DRAFT	CHKD	APPD
	X1	COMPLEAT[illegible] RELEASED	12/7[illegible]		XTO		





ASSEMBLY NOTES

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3. CLEAN & INSPECT AS PER SPEC S676.
4. FOR ELECTRICAL COMPONENT PART NUMBERS REFER TO NPL A
5. USE SYMBOL NUMBERS FOR ASSY. REF.

X	3	BS.00	SOLDER TIN ALLOY
3	2	TS211-1	SOCKET, 14 PIN LOW PROFILE
1	1	PC754	PRINTED CIRCUIT B.I

A5653
ASSEMBLY, P.C. BD.
LSB/USB CONTROL RDBK.

1	ADC-5A	AX5190
QTY / UNIT	MODEL USED ON	ASS'Y NO

APPLICATION

CODE

REF CK

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS	FRACTIONS
.X ± 05	± 1/64
.XX ± 01	ANGLES
.XXX ± .005	± 0° 30'

MATERIAL

FINISH