automated broadcast controls

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25000 TONE SENSOR
OPERATION MANUAL

TABLE OF CONTENTS

INTRODUCTION

1-1 The 2500S (VT) has been designed to work in conjunction with an existing reel to reel machine in order to provide time correction capability for voice intro/outro formats. Upon a time signal command, the unit switches the voice track machine into the run mode and disables the normal left track sensor until a 25Hz tone is detected on the right channel.

SPECIFICATIONS

Update Input: 4.2v→18v true. (DTL-TTL or contacts)

Detector Bandwidth: 25Hz ± 10%

Insertion Loss: Negligable

25Hz Sensitivity: -18dB

Input: 10K ohm

Stop Delay: Adjustable 0 - 10 seconds nominal

Dimensions: 1 5/8" H x 16" W x 9" D behind front panel
1 3/4" x 19" standard EIA notched mounting

Net Weight: 5 lbs.

Shipping Weight: 7 lbs.

Power Requirements: 115 VAC, 50-60Hz, 5 watts
Export Models Available

Fuse: 1/8 amp 3AG

Interface Controls: "Stop Relay" - SPDT, momentary
Stop Over Ride - SPDT, latching
Start - SPDT, latching
All interface controls are isolated relay contacts rated 2 amps @ 26VDC or 1 amp @ 115VAC, noninductive load

2-1 UNPACKING AND INSPECTION - SECTION II

Upon receipt of the equipment, unpack and inspect the unit for shipping damage. Claims should be filed with the delivering carrier within 10 days. The original carton and shipping material must be retained for any claim. Units received by ABC under Warranty must be packed in original container.

3-1 INSTALLATION - SECTION III

Electrical - In order to protect operating personnel, the National Electrical Manufacturers Associates recommends that the instrument panel and chassis be grounded. The 2500S (VT) is provided with a 3 wire power cable which, when plugged into the proper receptical, grounds the unit.

3-2

Rack Mounting - The unit is provided with standard EIA 19" rack mounting. Care should be taken when mounting to ensure proper electrical grounding with the rack cabinet.

3-3

Rear Chassis Connections (refer to diagram 8-1)

TB-1 Control Functions

FUNCTION	TERMINAL		OPERATION
Stop Override Relay	1	N.C.	Activated by Time Input By-pass the stop contact on the normal sensor so as to not stop on left channel tones
	2	N.O.	
	3	Com	
Stop Relay	4	N.C.	Activates for 1/2 sec. duration at the end of the delay period.
	5	N.O.	
	6	Com	
Start Relay	7	N.C.	Activated by time input Starts the voice track machine dead rolling.
	8	N.O.	
	9	Com	
Time Input	10	Gnd	To +5 - +18v to activate Normal ground.
	11	Hi	
+18	12		

TB-2 Audio

B ChannelSense Input	1	Hi	10K input senses 25Hz tone
	2	Gnd	
Internal Connection Do Not Use	4		

OPERATING INSTRUCTIONS - SECTION IV

The 2500S (VT) is designed to respond to a 25Hz signal tone placed on the "B" channel of a recorded voice track tape. Program material must be properly filtered to remove 25Hz content before being recorded to prevent "falsing". The 25Hz tone should be recorded at a standard level of -7dbm to insure continued results over the life of the tape. The Automated Broadcast Controls 2500G has been designed to provide the necessary filtering and low distortion tone required for successful operation. Use of a standard audio generator is discouraged, due to frequency instability and distortion.

Upon receipt of a "high" true time signal (TTL-DTL or contacts) the internal "start" and "stop override" circuits activate causing the voice track machine to deadroll through all remaining selections until the 25Hz tone on the "B" channel is reached.

4-2 Update Indicator

This indicator will light upon receipt of a time correction signal. It will remain lit until the end of the 25Hz tone on the "B" channel. Depressing this button will manually reset the "hold" circuits.

4-3 Stop Delay

A delay circuit has been incorporated in the unit to allow proper cueing to the next program selection. The delay is activated on the "trailing edge" of the 25Hz tone. The adjustment (R-27) should be set so the tape transport actually stops immediately before the beginning of the next program selection thus providing proper "air sound".

WARNING: No other adjustment should be made without proper equipment, (refer to Alignment section).

THEORY OF OPERATION

5-1 General

The 2500S(VT) is totally solid state utilizing the latest techniques and components available. Refer to diagram 8-3 for the block diagram of the circuitry layout.

5-2 Limiter and Detector

CR1 and CR2 provide input limiting for the detector to prevent overload. R1 and C18 form a low pass filter to eliminate high frequency signals. U1 and the notch filter form a high gain 25Hz detector whose output is fed to the triggering circuit.

5-3 Trigger and E.O.M. Driver

The band passed 25Hz signal is fed into CR3 for rectification and into R10, 11 and C9 for filtering. The resulting D.C. signal is fed into Q1 where it is amplified and refiltered for the schmitt trigger (Q2). Upon acquisition of the proper level signal, Q2 cuts off and causes Q1 to clamp. Q3 provides driver for the EOM relay and indicator.

5-4 Stop Delay and Driver

Removal of the 25Hz tone on the input causes the collector of Q2 to go to ground. C11 and R19 form a RC pulse circuit which momentarily drop to ground causing U2 to trigger. Once triggered Pin 3 of U2 goes to +12v for the period determined by R27, then returns to ground. R28 and C14 form a time hold circuit which causes K2 to pull in and hold for 1/2 sec. when pin 3 of U2 returns to ground.

5-5 Power Supply

The power supply circuit board is a three voltage regulated output. The positive side of CR1 provides 18v while the negative side provides -18v. CR4 draws power from the 18v through R1 to produce a regulated +12v. CR2 and CR3 maintain regulation on the

(5-5 Power Supply continued)

plus and minus 18v supplies. The primary of the transformer is fused with 1/8th amp fuse.

6-1 ALIGNMENT - SECTION VI

General

The 2500S (VT) is factory aligned and should require no further adjustments.

Warning: Do not attempt alignment without the proper test equipment.

6-2 Detector Board C

Required: (a) Accurate 25Hz source

(b) Calibrated AC voltmeter

(c) Refer to diagram 8-4 for adjustments

1) Connect the 25Hz signal source to channel B input and set level for -18dbm Connect the signal meter to the output of the signal generator.
2) Tune R25 and R26 alternately until the ECM relay is activated.
3) Recheck the output level to assure proper operation at -18dbm

6-3 Stop Relay

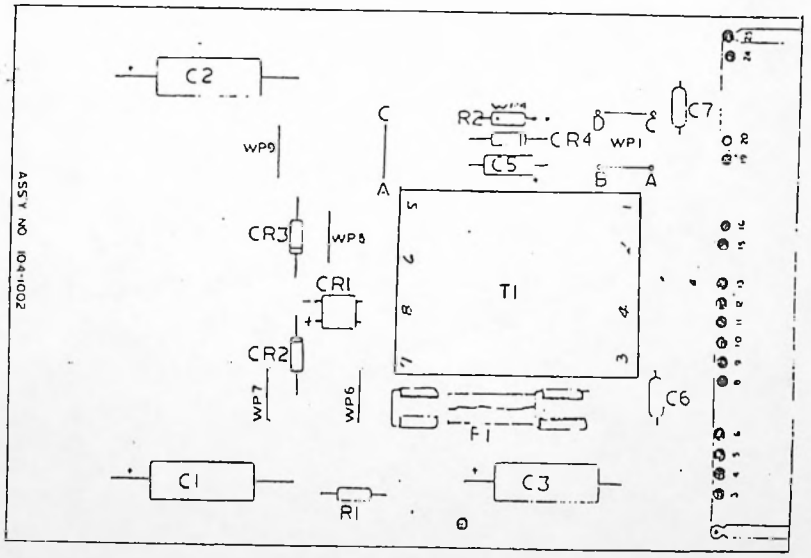
Required: (a) 25Hz source

1) Connect the 25Hz source to the B channel input (prerecorded tape may be utilized). Feed in enough signal to achieve proper activation of the detector (-7dbm nominal).
2) Remove the tone input and note the time until relay K2 energizes
3) Set R-27 for required delay.

This completes alignment. Operate the 2500S (VT) with its' top cover on to provide proper shielding. More detailed alignment charts and proofs may be obtained by writing to Automated Broadcast Controls

TROUBLE SHOOTING - SECTION VII

DIFFICULTY	POSSIBLE CAUSE
1) Unit is completely inoperative	Fuse F-1 blown CR1, open or shorted CR2, CR3, CR4, shorted C1, C2, C5 shorted transformer open
2) Unit "falses" on regular program material	CR1, CR2 open Recorded music not properly filtered.
3) Detector fails to operate	CR1, CR2, shorted Q1, Q2, Q3, or U1 inoperative CR3 open
4) Detector insensitive	U1 inoperative Wrong supply voltages Alignment required
5) Stop Relay Inoperative	Bad relay Q2, Q4, U2 inoperative R27, open No. T12v
6) Start and Stop override Relays remain closed	CR-10 shorted Reset button shorted Q3 shorted



"NOTE"
DO NOT USE IN ALL E.M

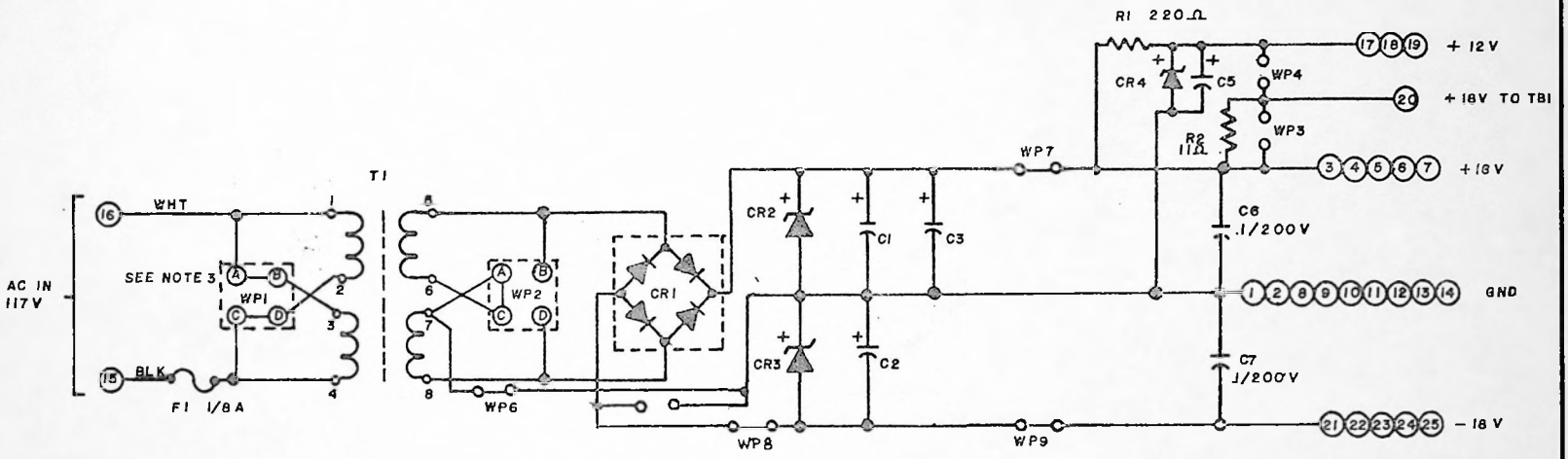
A		RELEASE	
CH	DATE	CHANGE	

Automated Broadcast Control

+18/-18/+12V PWR. SUPPLY

AMERELEX 104-1002

104-K02



CR2, CR3 – IN6355
CR4 – IN4742A
C5 – 10/20V
C1, C2, C3 – 1000/25V
C5 – 10/20V

"NOTE"

1. SEE ASSEMBLY DWG. FOR COMPONENT AND JUMPER LOCATION.
2. WP – JUMPER
3. FOR 230V, JUMPER WP1 B AND D ONLY.

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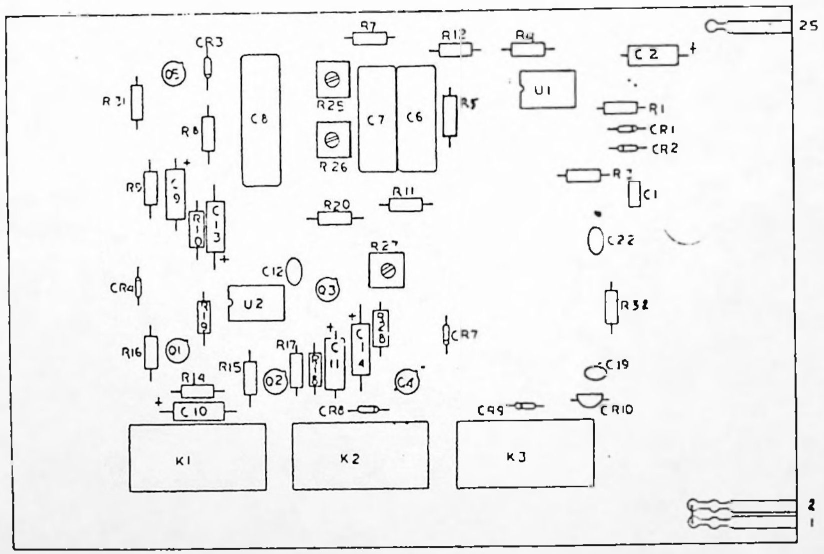
SCALE: NONE	APPROVED BY: J. A. Winter	DRAWN BY NOEL
DATE: 9-12-75		REVISED

+18/-18/+12V POWER SUPPLY

ASS'Y 104-1002-1

DRAWING NUMBER A120-1001-1

8½X11 PRINTED ON NO. 1000H CLEARPRINT



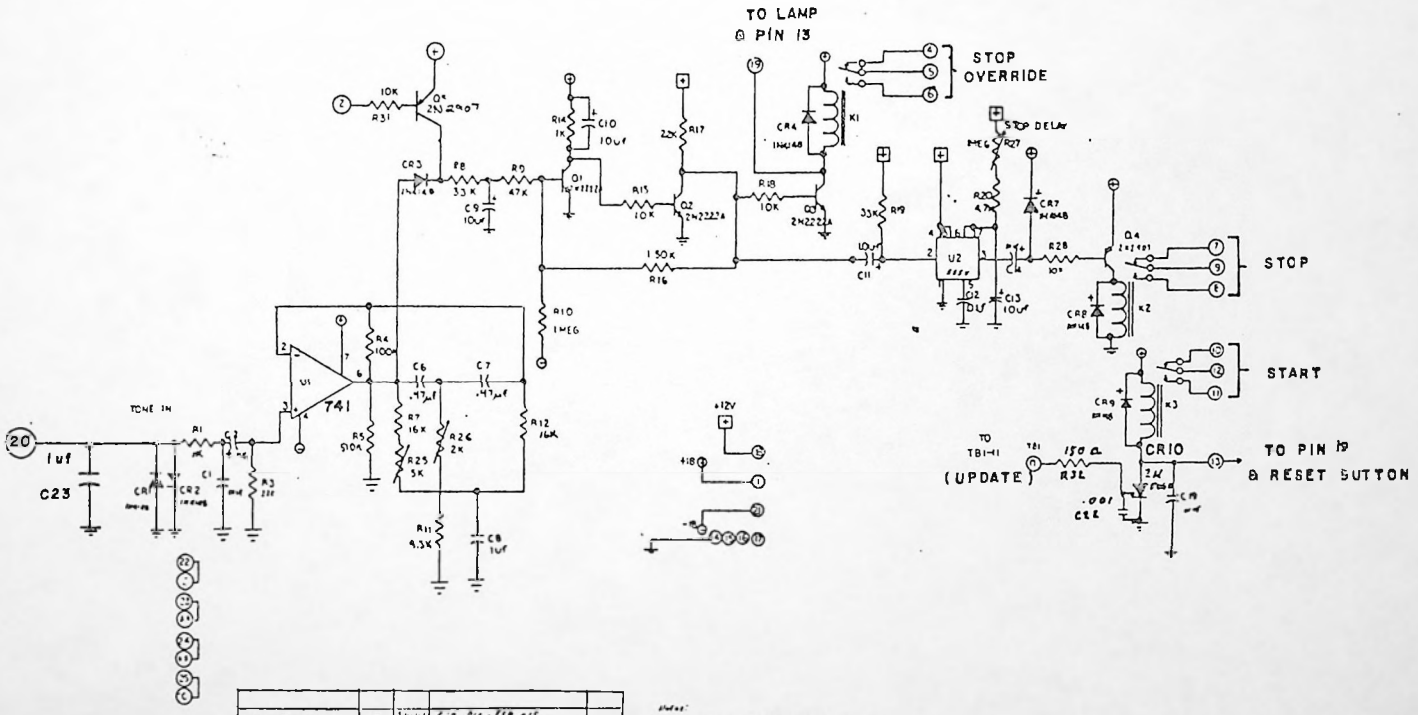
A	Jumper Added Bet Pin 1 & 2
REV	

Automated Broadcast Control

1 2 | 9-4-74 | 4JF

VT. DET. CIRCUIT ASSY

D-04-1027



	C	1/4W		
	B	1/4W		
NOTE	REV		CHANGE	INIT

Automated Broadcast Controls

25HZ TONE DETECTOR VT

ASSY 104-1027-2 C

C120-1033

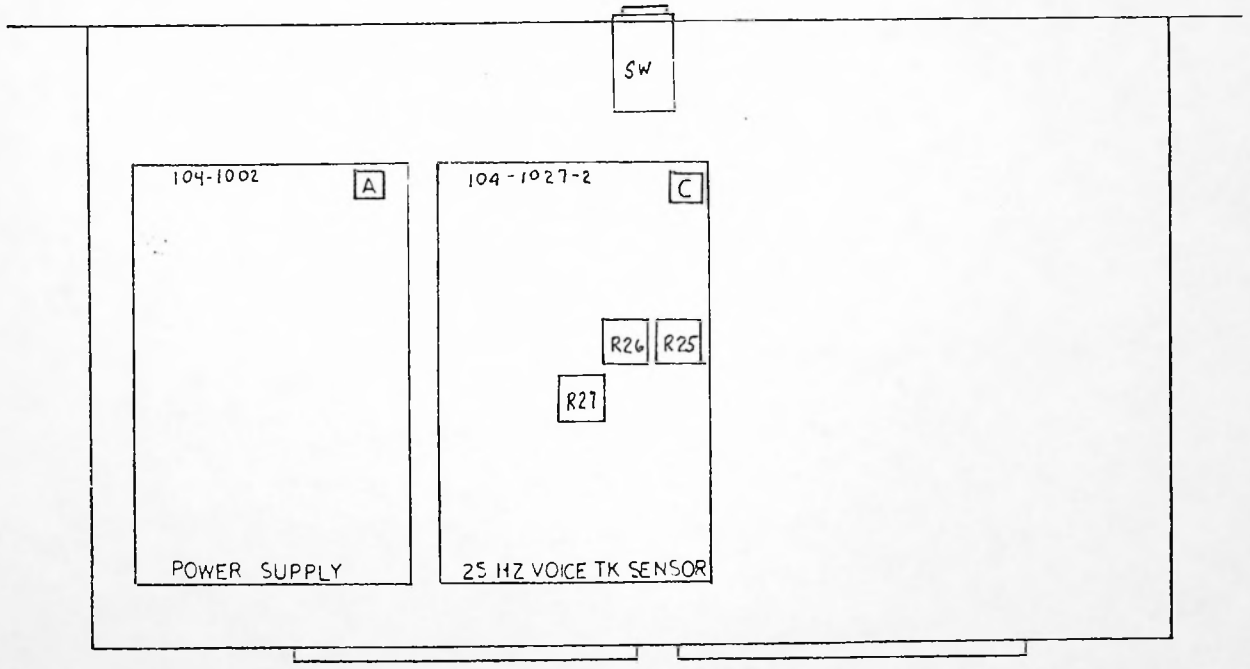
POWER SUPPLY

Assembly 104-1002-1

ITEM	PART	COMP. DESIGN	DESCRIPTION
1	111-1002		Circuit Board
2	221-1008	C1,2,3,	Cap. Electr. 1000 uf
3	402-1001	CR1	Diode Bridge 920-1
4	403-1005	CR2,3	Diode Zener, 1N5355
5	420-1001	T1	Power Transformer 24-250
6	328-1001	Loc. F.	Fuse Clip
7	403-1003	CR4	Diode, Zener, 1N4742
8	382-1003	R1	Resistor, 1/4N, 220
9	221-1005	C5	Cap. Electr. 10 uf
10	264-1005	1-25	Term. P.C.
11	410-1017	F1	Fuse, 1/8A
12	223-1002	C6,7	Cap. Poly 0.1 uf 200v
13	382-1001	R2 (loc WP4)	Resistor 1/4 W. 11 ohm

DETECTOR
Assembly 104-1027 - 2

ITEM	PART	COMP. DESIGN	DESCRIPTION
1	111-1027-2		Circuit Board
2	401-1006	U1	I.C. 74
3	401-1003	U2,	I.C. NE555V
4	370-1001	K1,K2,K3	Relay Spdt. Amer. Zettler
5	404-1001	Q1,Q2,Q3	Tran. NPN 2N222
6	404-1002	Q4, Q5	Tran. PNP 2N2907
7	402-1003	CR1,2,3,4,5,7,8,9	Diode 1N4148
8	405-1001	CR10	Scr 2N5060
9	221-1001	C2,C11,	Cap. 1.0 uf @ 35v Tan
10	223-1005	C8 , C23	Cap. 1.0 uf @ 200v Poly. 10%
11	221-1005	C9,10,13,14	Cap. 10 uf @ 20v Tan
12	222-1005	C22	.001 uf Disc
13	382-1023	R32	150 Ohm ½ w. 5%
14	223-1004	C6,C7	Cap. .47 uf @ 200v Poly. 10%
15	222-1006	C1,12, 19	Cap. .01 uf @ 25V Disc.
16	382-1005	R1,R14	Res. 1K 1/4 W. 5%
17	382-1011	R15,18,28,31	Res. 10K 1/4 W. 5%
18	382-1009	R9,R20	Res. 4.7K 1/4 W. 5%
19	382-1006	R2,R17	Res. 2.2K 1/4 W. 5%
20	383-1010	R7,R12	Res. 16.0K 1/4 W.2%
21	382-1012	R3,R32	Res. 22K 1/4 W. 5%
22	382-1008	R8	Res. 3.3K 1/4 W. 5%
23	383-1003	R11	Res. 4/3K 1/4W. 2%
24	382-1017	R4	Res. 100K 1/4 W. 5%
25	382-1020	R10	Res. 1 Meg. 1/4 W. 5%
26	263-1011		8 Pin Dip Socket
27	382-1014	R19	Res. 33K 1/4 5%
28	390-1005	R25	Res. Var. Pot 10K
29	390-1003	R26	Res. Var. 2K
30	390-1008	R27	Res. Var. 1 Meg.
31	382-1027	R16	Res. 150K ½ 5%
32	382-1004	R5	Res. 510 ½ 5%



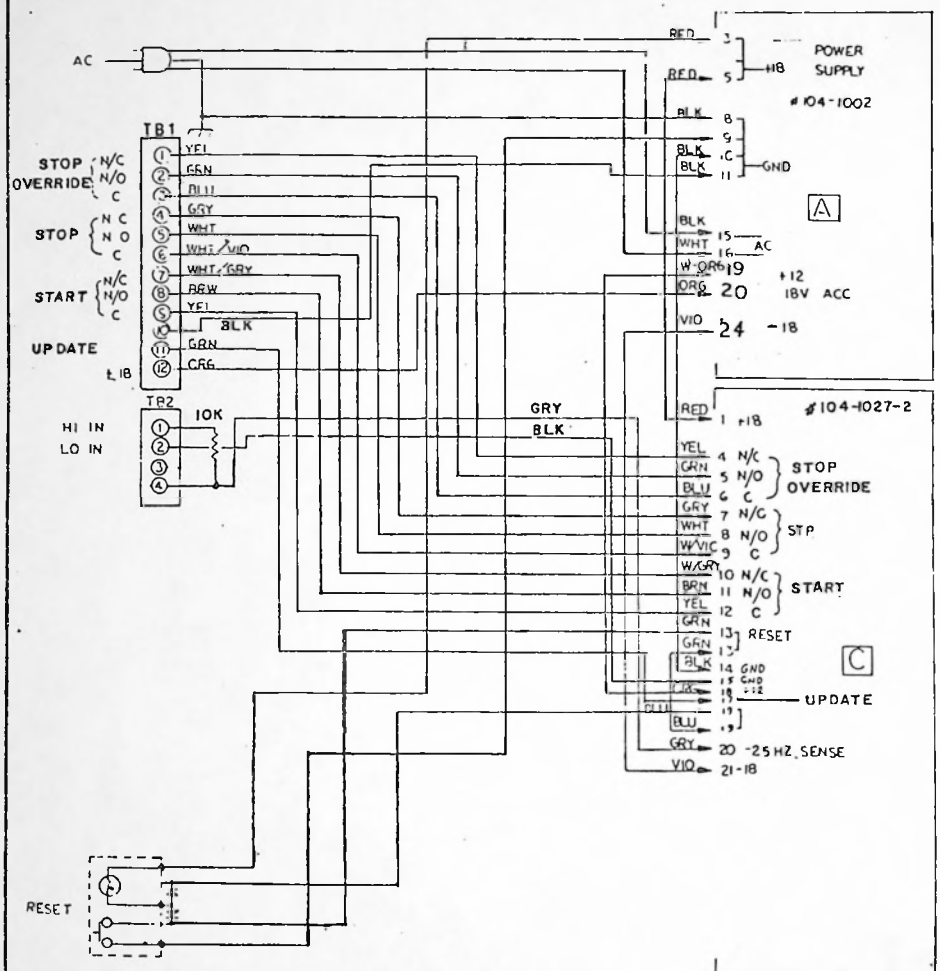
AUTOMATED BROADCAST CONTROLS

SCALE: 'N ONE	APPROVED BY:	DRAWN BY N.J.P
DATE: 16 SEP 74		REVISED

PICTORIAL VIEW + ADJUSTMENT

2500SVT

DRAWING NUMBER A122-1016



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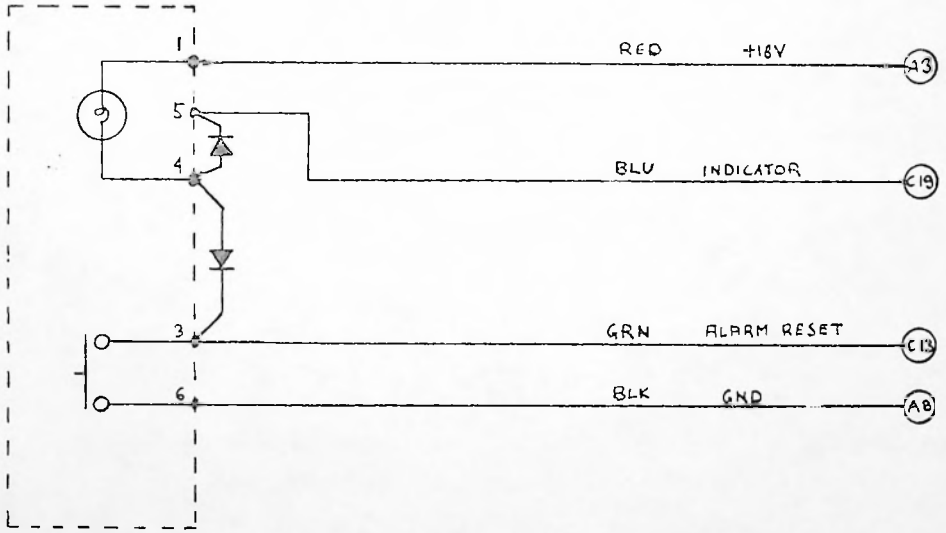
2500S (VT) INTERCABLING C121-IC27

#410-1002



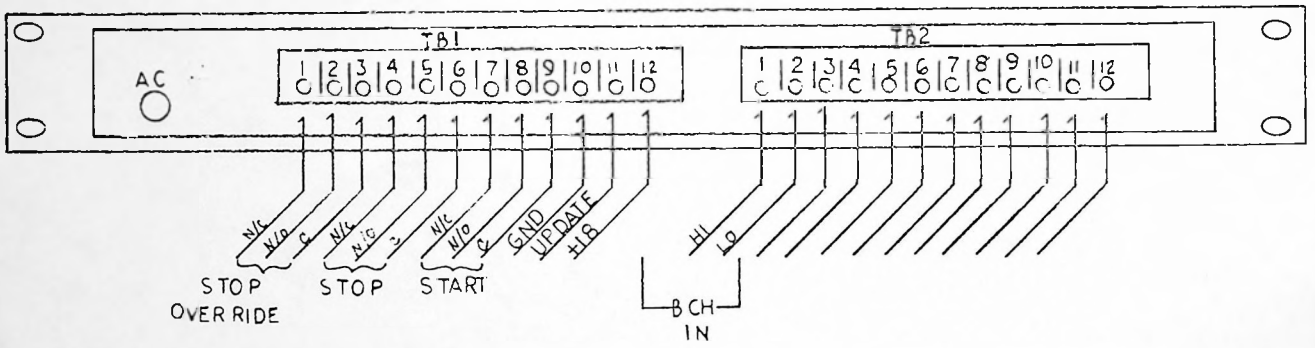
AUTOMATED BROADCAST CONTROLS

SCALE: NONE	APPROVED BY: Richard Chay	DRAWN BY TC
DATE: 25SEP73		REVISED

BUTTON ASSEMBLY

2500S & SVT

DRAWING NUMBER A121-1003

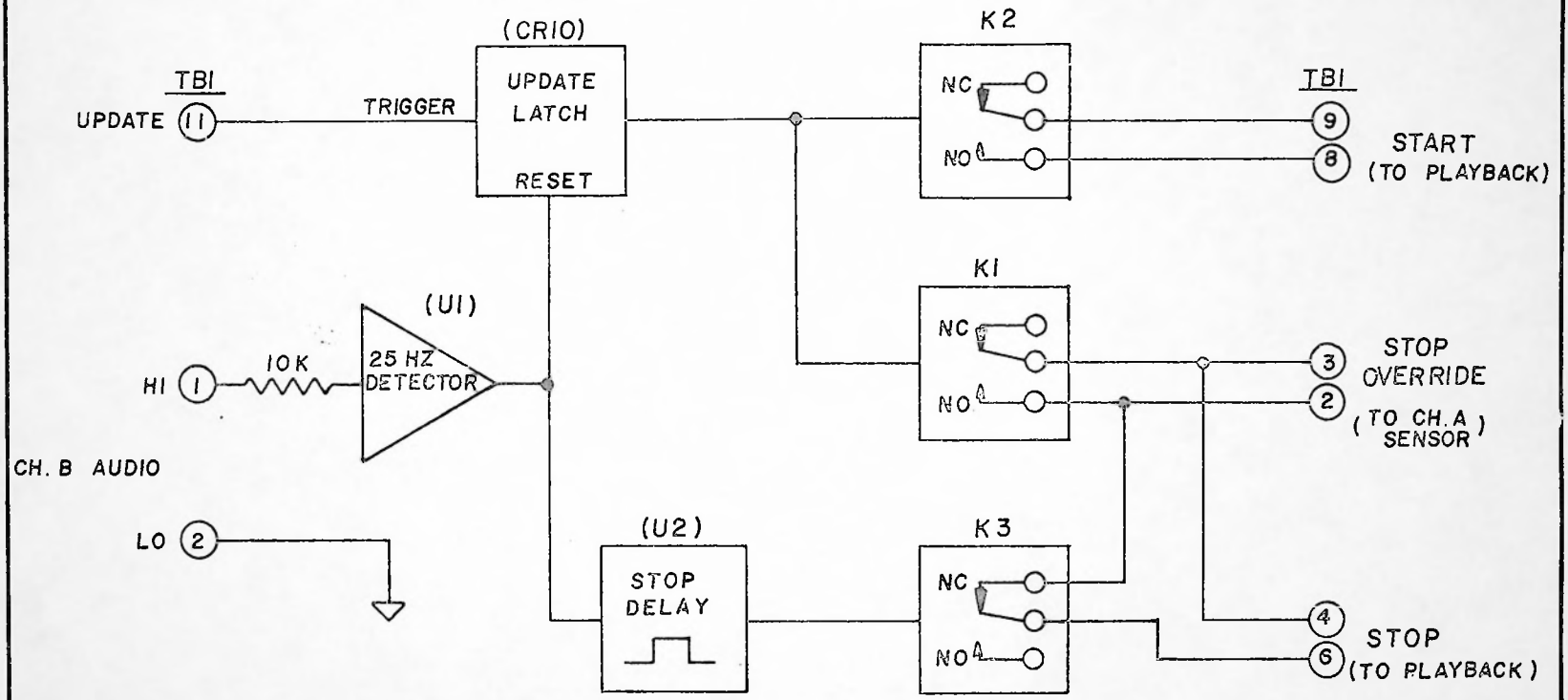


AUTOMATED BROADCAST CONTROLS

SCALE: NONE	APPROVED BY:	DRAWN BY N.J.P
DATE: 16 SEP. 74		REVISED

2500SVT REAR PANEL

DRAWING NUMBER A122-1022

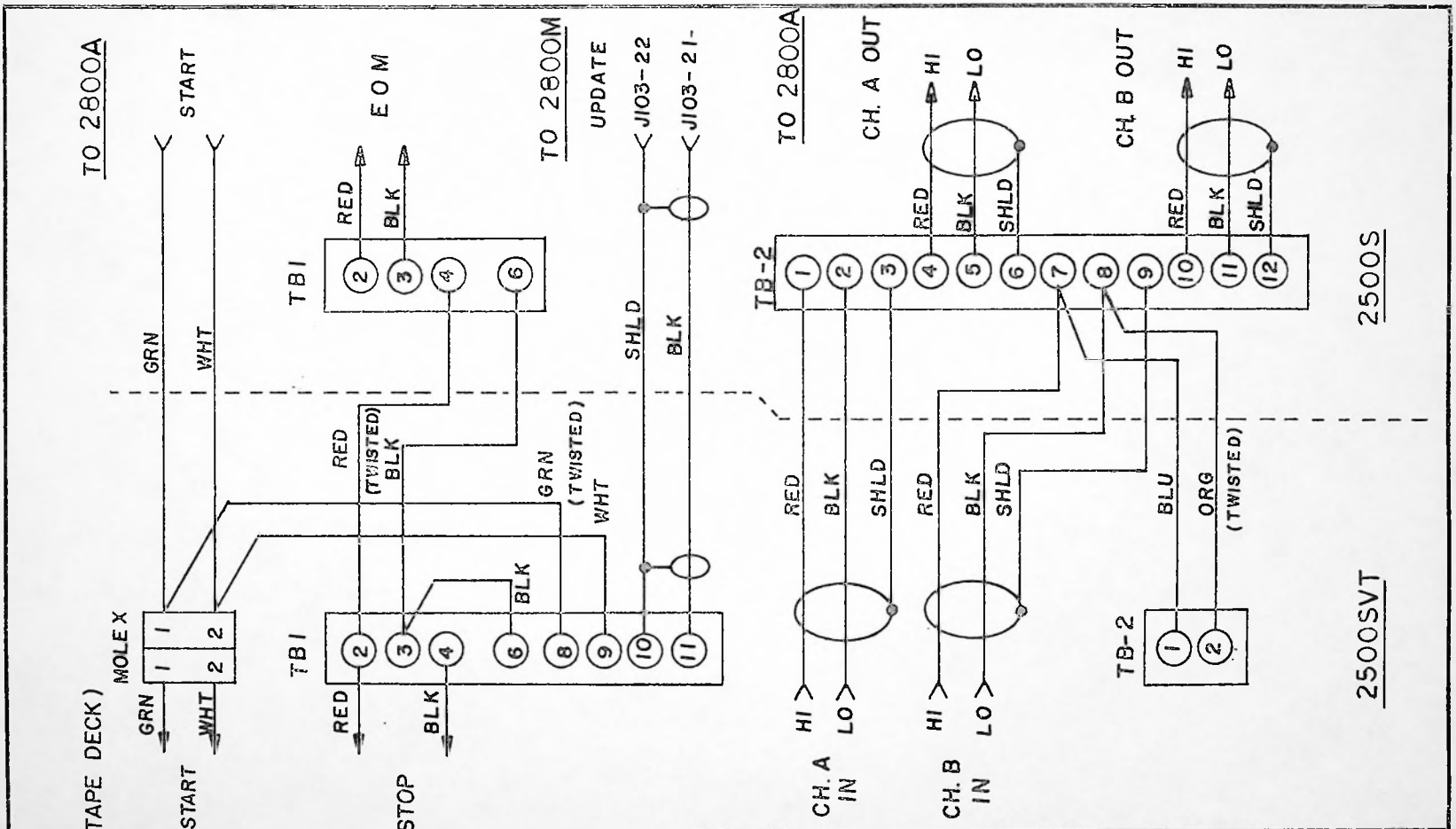


AUTOMATED BROADCAST CONTROLS

SCALE: NONE	APPROVED BY:	DRAWN BY NOEL
DATE: 1/17/76	JA Wittke 1/17/76	REVISED

VOICE TRACK BLOCK DIAGRAM

DRAWING NUMBER A122-1015

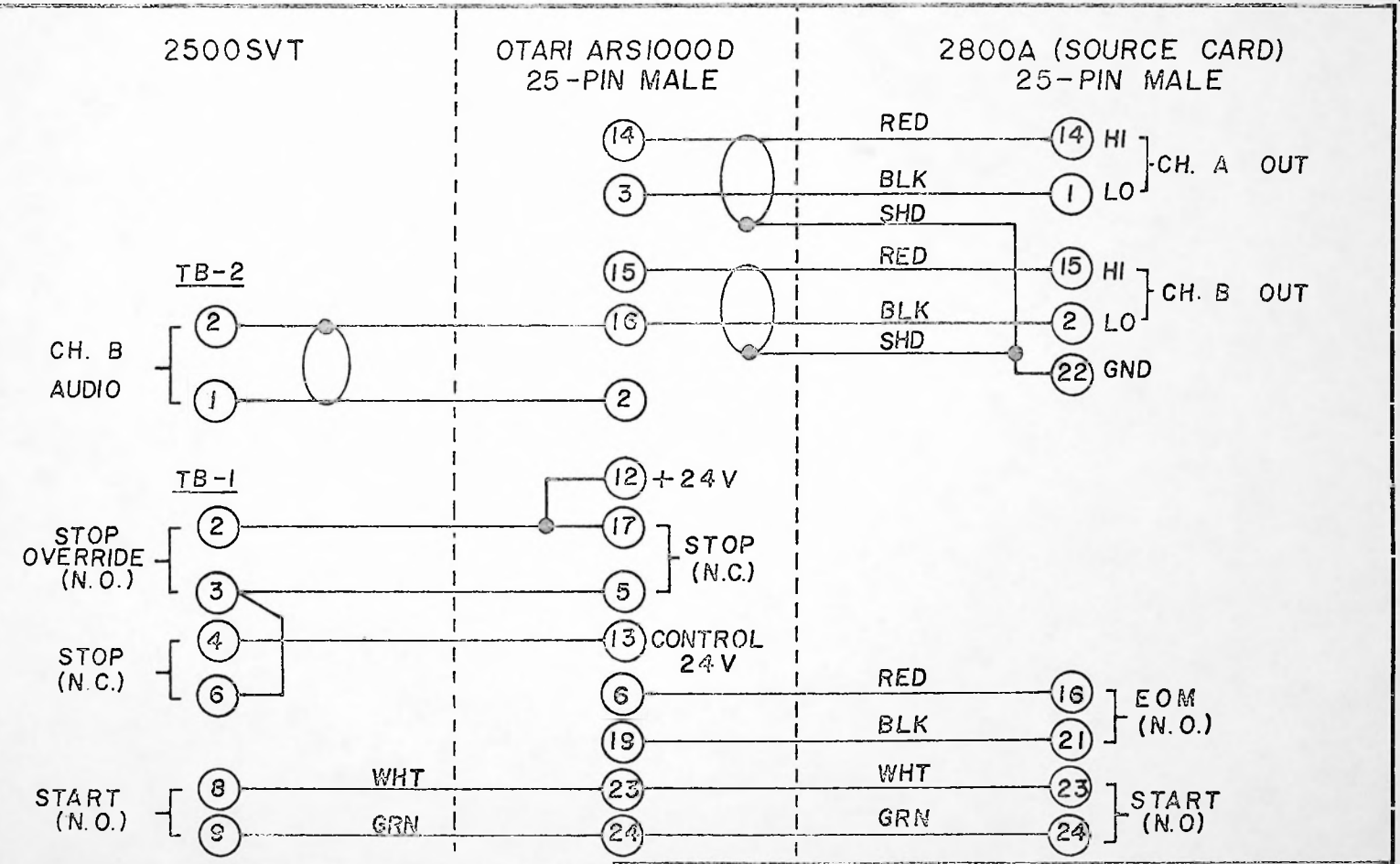


AUTOMATED BROADCAST CONTROLS

SCALE: NONE	APPROVED BY: J.A. White 1/17/76	DRAWN BY NOEL
DATE: 1/17/76		REVISED

2500S/SVT INTERCONNECTION

DRAWING NUMBER A121-1010



AUTOMATED BROADCAST CONTROLS

SCALE: NONE	APPROVED BY: J. A. Winter	DRAWN BY N. de Plater
DATE: 4-26-76		REVISED

OTARI ARS1000D/ 2500SVT/ 2800A

DRAWING NUMBER A121-1046