

## General Information

1994

**Video: 4 Heads Rotary**  
**Audio: Fixed Head 1 CH**  
**Covers Models**  
**Akai VS-G404/VS-G411**  
**Akai VS-G417/VS-G418**  
**Akai VS-G511**

## Matrix

Item	See Model
Mechanical Parts View	Akai VS-G215
Mechanical Adjustments	Akai VS-G215
Power Supply	Akai VS-G215
VPS/PDC	Akai VS-G215
VIF Units	Akai VS-F260
Other Remote Control Units	Akai VS-G215

## Service Adjustments

### Error Announcement

When a malfunction occurs, the following error indicators appear on the FL display to indicate the problem when the power is turned off.

Err 1 = All power supply has short circuited.

- Err 2 = The loading motor has been stopped irregularly. (When the mechanism position detect switch is not able to read the specified code, that is to say not able to reach to the specified position within the specified time.)
- Err 3 = The drum motor has been stopped. (When the drum motor does not rotate due to condensation etc)
- Err 5 = The capstan motor has been stopped. (When the capstan motor does not rotate.)

### Presets in the Test Mode

#### 1: Engaging the "TEST MODE"

To set the VCR to the TEST MODE, press the "reset" button on the front panel first then plug in the AC power cord while pressing and holding both the "POWER" and "STOP/EJECT" buttons on the front at the same time. Next, release your fingers from both the buttons a few seconds later and press the "POWER" button.

#### 2: Version Code Preset

- Engage the "test mode". The version (model) code will be displayed on the lower right part of the screen in 8 digit form.
- While pressing both the "FF" and "RWD" buttons, press the "RESET" button. The address and its data will be shown in the RL display.
- Select the address "60" by pressing the "FF" or "RWD" button.

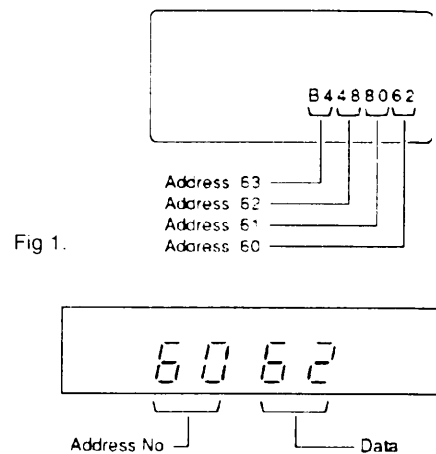


Fig 1.

- Choose the data in the address 60 column that corresponds to the model number you are working on from the following list. Set the chosen data value by pressing the "STOP" or "PLAY" button.
- Memorize the data into the EEP ROM IC by pressing the "REC" button. The address "61" and its data will be shown in the FL display. Repeat the presetting (steps 4 to 5) for addresses "61," "62" and "63" in the same manner as address "60".
- Disconnect the AC power cord from the AC outlet to disengage the version (model) code mode.

Model	Model Code	Address			
		60 (h)	61 (h)	62 (h)	63 (h)
VS-G405EA	34C2 042C	2C	04	C2	34
VS-G405EDG	36C0 05AC	AC	05	C0	36
VS-G411EM(E)	74C0 07AC	AC	07	C0	74
VS-G411EM(Y7)	74C0 07AC	AC	07	C0	74
VS-G411EOH(Y1)	74C8 066C	6C	06	C8	74
VS-G411ES	70C0 07AC	AC	07	C0	70
VS-G415EA	F4C2 06AC	AC	06	C2	F4
VS-G415EK	F4C4 842C	2C	84	C4	F4
VS-S415EO	F4C0 066C	6C	06	C8	F4
VS-G415EOH(E)	F4C8 06EC	EC	06	C8	F4
VS-G415EOH(Y1)	F4C8 866C	6C	86	C8	F4
VS-	F4C8	6C	06	C8	F4

**Note:**  
 This version code preset is absolutely necessary when the IC404 (EEPROM) on the MAIN PCB is replaced.

#### 3: Video Switching Point Preset

- Engage the "test mode".
- Connect CH-1 of an oscilloscope to VIDEO OUT and CH-2 to the TP1 (V-SWP) on the PRE AMP PCB for triggering.
- Play back the reference tape TF-530RFS (AT-751775) and press the "REC" button during playback.

- Confirm that the switching point is positioned 6.5 +/- 0.3H before the left edge of the V-sync as shown.

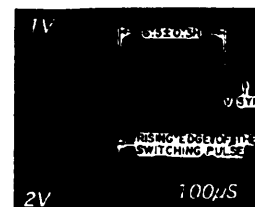


Fig 3.

**Note:**  
 This switching point preset is absolutely necessary when conditions are as follows:

- When the video head drum (upper drum) is replaced.
- When the DRUM MOTOR PCB or DRUM MOTOR's ROTARY MAGNET (ROTARY PLATE) is replaced.
- When the SERVO/SYSCON MI-COM or EEP ROM IC on the MAIN PCB is replaced.

#### 4: Memorization of the reference RF envelope detect voltage (I-HQ)

For correct operation of the I-HQ tape turning system, memorization of the reference RF envelope detect voltage is absolutely necessary. When the VIDEO HEAD DRUM, PRE-AMP PCB or EEP ROM IC is the MAIN PCB is replaced for any reason, memorize the reference RF envelope detect voltage according to the following procedure.

- Set the tape speed to "SP mode".
- Make a recording on the I-HQ test tape "TF-556AT" (AT-751822J) and rewind it to the exact point where the recording was started.
- Set the VCR to the "test mode" then start playback.
- Reference RF envelope detect voltage data in the memory is displayed in 2 digits in the hours display part of the FL display and the present envelope detect voltage data is displayed in 2 digits in the minutes display part (the data is displayed in hexadecimal numbers).
- After the auto tracking has been activated, press the "CANCEL" button on the remote control unit. The present RF envelope detect voltage data will be transferred to the hours part's 2 digits and memorized in the EEP ROM IC.
- Cancel the "test mode" then set the tape speed to "LP mode" and repeat steps 2 to 5.

#### 5: Other facilities in the test mode

- Tracking Position Display

In the "SP play" mode, tracking position data can be displayed on the FL display. Data is displayed in 64 steps in hexadecimal numbers from "00" to "3F" in the seconds display part on the FL display. Pressing the "TV/VCR" button on the remote control unit during playback directly sets the tracking

to the maximum "3F" position and pressing the "COUNTER RESET" button sets it to the minimum "00" position.

Pressing the "PLAY" button during playback sets tracking to the centre position "1F" automatically. "1F" does not appear even when the "PLAY" button is pressed, keep pressing the "<" or ">" cursor button on the remote control unit until "1F" is indicated and then press the "OK" button to memorize the position.

#### 2: TIMER function confirmation

During the "test mode", the clock's minute part is advanced by a second when the power is turned off. This means that the "timer" function can be confirmed in a short time.

#### 3: Suspension of the tape protection system

When the VCR is not in the "test mode", the "REC PAUSE" mode will be released after 30 minutes in order to protect the tape. The "STILL" mode will also be released after 5 minutes. During the "test mode", however this tape protection system will not operate.

\* Video head rotation will stop 5 min. after the "REC PAUSE" mode has been engaged even during the test mode.

## Electrical Adjustments

**Precautionary items prior to adjustments**

- The colour bar generator output should be 1.0 Vp-p.
- The video output terminal should be terminated with 75 ohms (connect dummy load or 75 ohms input TV).

The following test tape is required

Test tape	Parts No.
TF-532CBS	AT-751360

**STEP ADJUSTMENT ITEM**

- MODE and INPUT SIGNAL/TEST TAPE
- TEST POINT and ADJ part
- REMARKS (\*) & RESULT (\*)

**4 | CARRIER SET & DEVIATION**

- "E" Stair step signal
- RE73 & VR604 (CARRIER) VR605 (DEVIATION)
- Connect an oscilloscope to the lead of the RE73 or IC602 (E pin (REC FM OUT) on the reverse side of the MAIN PCB)
- Adjust VR604 and VR605 alternately until the result is satisfactory
- VR604 (CARRIER): 0.263 µs (3.8 MHz)
- VR605 (DEVIATION): 0.208 µs (4.8 MHz)

**5 | Y REC CURRENT**

- "REC" (SP), no signal input
- TP3 (REC-Y) & VR1 (REC-Y)
- Connect an oscilloscope to the TP3 pin on the PRE AMP PCB.
- Adjust VR1 so that the Y REC current is 1.8 Vp-p.

**6 | CHROMA REC CURRENT**

- "E" PAL colour bar signal
- TR691 (E), TR615 (E) & VR691 (REC CHROMA)
- Connect an oscilloscope to the TR615 emitter and read the peak to peak level of the REC FM Y signal then connect the oscilloscope to the TR691 emitter.
- Adjust VR691 on the MAIN PCB so that the burst signal level becomes 25% of the Y signal level that was measured at the TR615 emitter.

**7 | VIDEO PB LEVEL**

- "REC" - "PB", stair step signal
- VIDEO OUT & VR606 (PB LEVEL)
- Connect an oscilloscope to VIDEO OUT
- Make a recording on a blank tape, then play it back
- Adjust VR606 so that the PB level becomes 1.0 Vp-p

**8 | CDR**

- "PB", test tape TF-532CBS
- VIDEO OUT TP1 (SWP) & VR3 (MIX GAIN), VR4 (PHASE ADJ)
- Connect CH-1 of an oscilloscope to VIDEO OUT and CH-2 to the TP1 on the PRE AMP PCB for triggering.
- Set the oscilloscope to delayed scanning mode and observe the (E part) (i.e. non-correlated part)
- After the auto tracking control has been activated, adjust the VR3 and VR4 alternately so that the non-correlated chroma signal (E part) is at its minimum level

**1 | VIDEO E-E LEVEL**

- "E" (STOP mode), PAL colour bar signal
- VIDEO OUT & VR602 (E-E LEVEL)
- Connect an oscilloscope to VIDEO OUT
- 1.0 Vp-p

**2 | HNS AFC**

- "E" PAL colour bar signal
- IC609 (E) pin & VL700
- Connect a digital DC voltmeter to the C605 pin
- Adjust VL700 so that the meter registers 2.5 V

**3 | WHITE CLIP**

- "E" PAL colour bar signal
- TR625 (EMITTER) & VR605 (WHITE CLIP)
- Connect an oscilloscope to the emitter of TR625
- Adjust VR605 so that the white clip level is 19.5% of the video level (the level from sync tip to white 100%)

INCORRECT

CORRECT

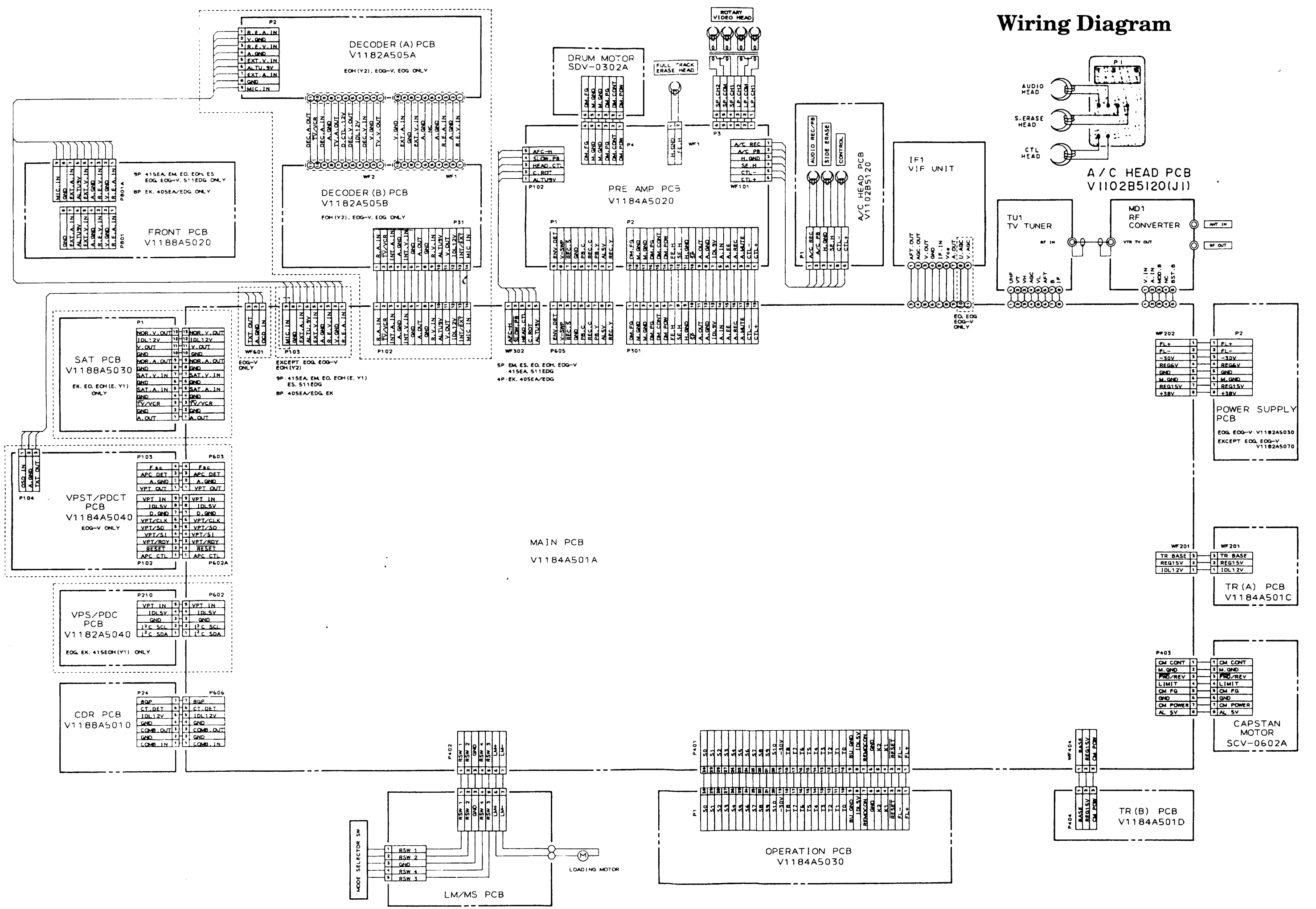
## Head Motors and Miscellaneous

Part No.	Description
HR-416732J	Head Combo HVMZA1161A
HE-422168J	Head E HVFHF0032A
BV-V1812A410C	Lower Drum BLK G415EA
BM-421746N	Motor Part
BM-419269N	Motor SCV-0602A
BM-419324J1	Motor SDV-0302A
BV-V1182A420B	Upper Drum BLK G415EA

## Recommended Safety Parts

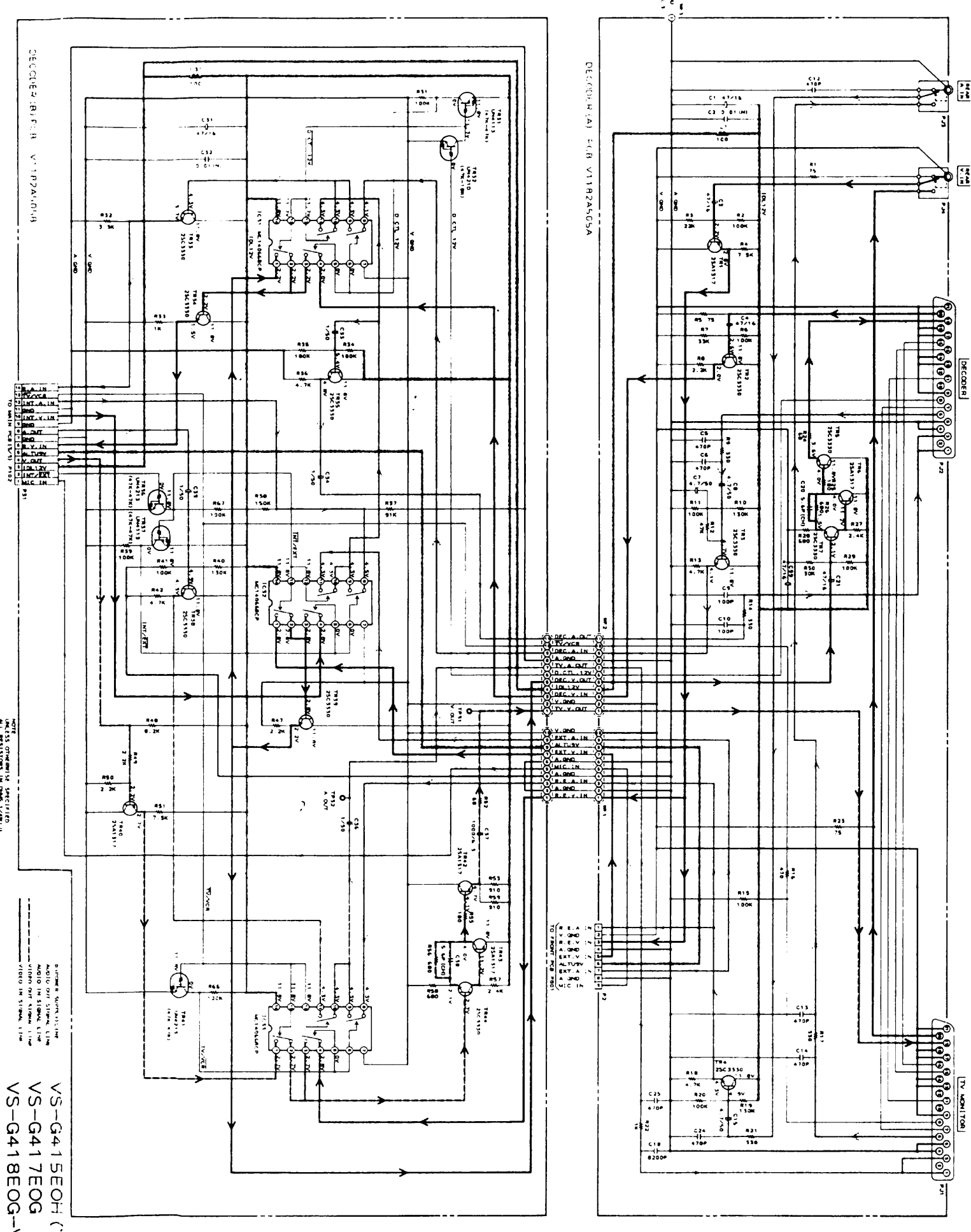
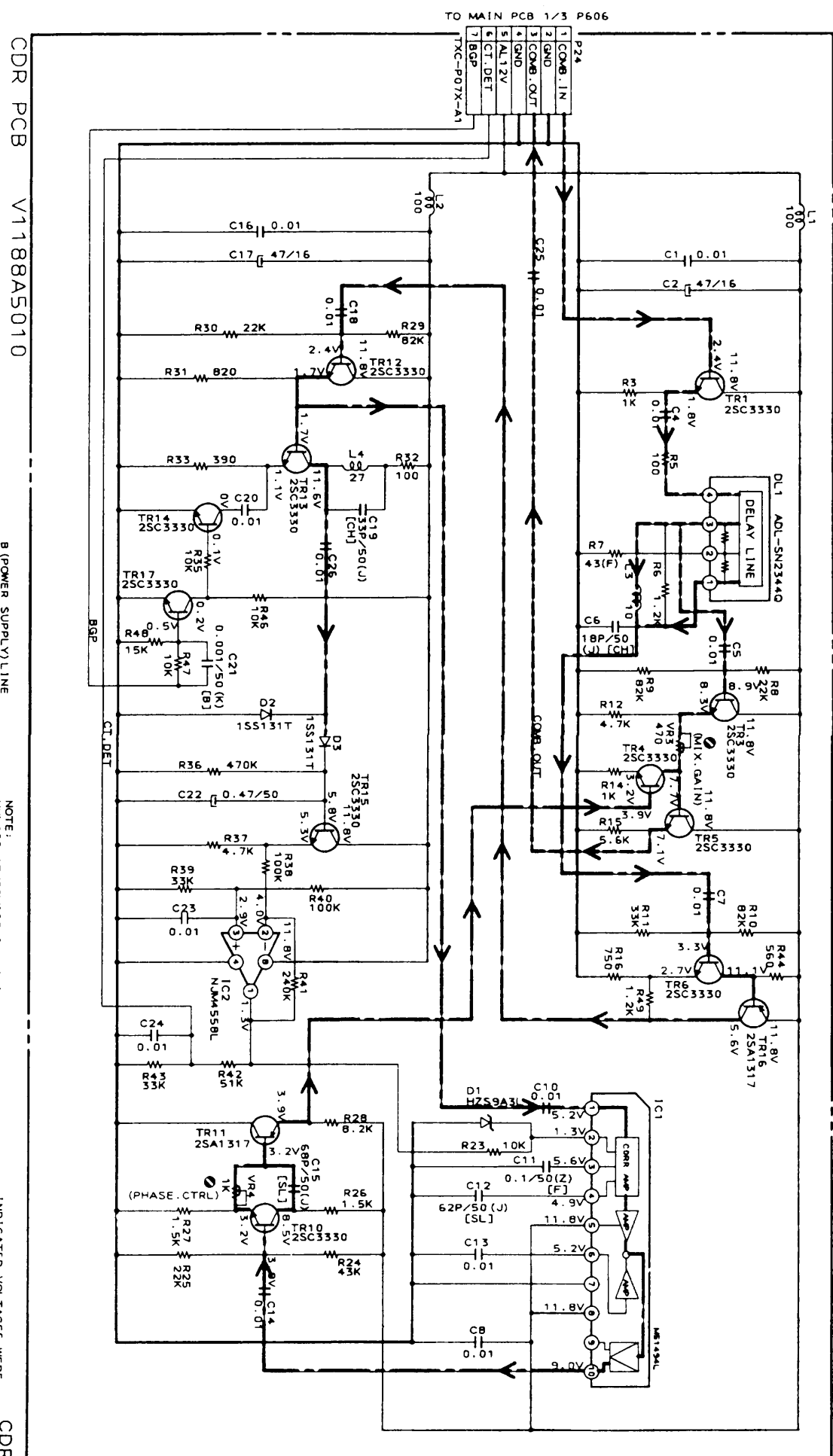
Item	Part No.	Description
D202	ED-397233J	D Zener H HZS5C3
D412, D413		
D416, D417	ED-511907	D Silicon 1N4002 100/1.0A
FR201	ER-397385J	R Fuse V TO5 RF 25SCVTP1/4WR20K
FR202	ER-410380J	R Fuse V TO5 RF25SCVTP1/4WR91K
FR204	ER-408829J	R Fuse V TO5 RF25SCVTP1/4WR11K
FR401	ER-400729J	R Fuse V TO5 RF25SCVTP1/4WR47K
FR402	ER-418648J	R Fuse V TO5 RF25SCVTP1/4WR24K
IC201	EI-418723J	IC NJM4558DX
IC203	EI-418723J	IC NJM7809FA
L201, 202	EO-422134J	Coil FIX 2 PC7-330K 330K
TH201	EO-422134J	Thermistor 911P83E101NH07 TO5
TR203	EO-422134J	TR C 2SD2118 Q,R,S FPTLT16E
TR211	EO-422134J	TR 2SB1306 Q,R TO5

Wiring Diagram



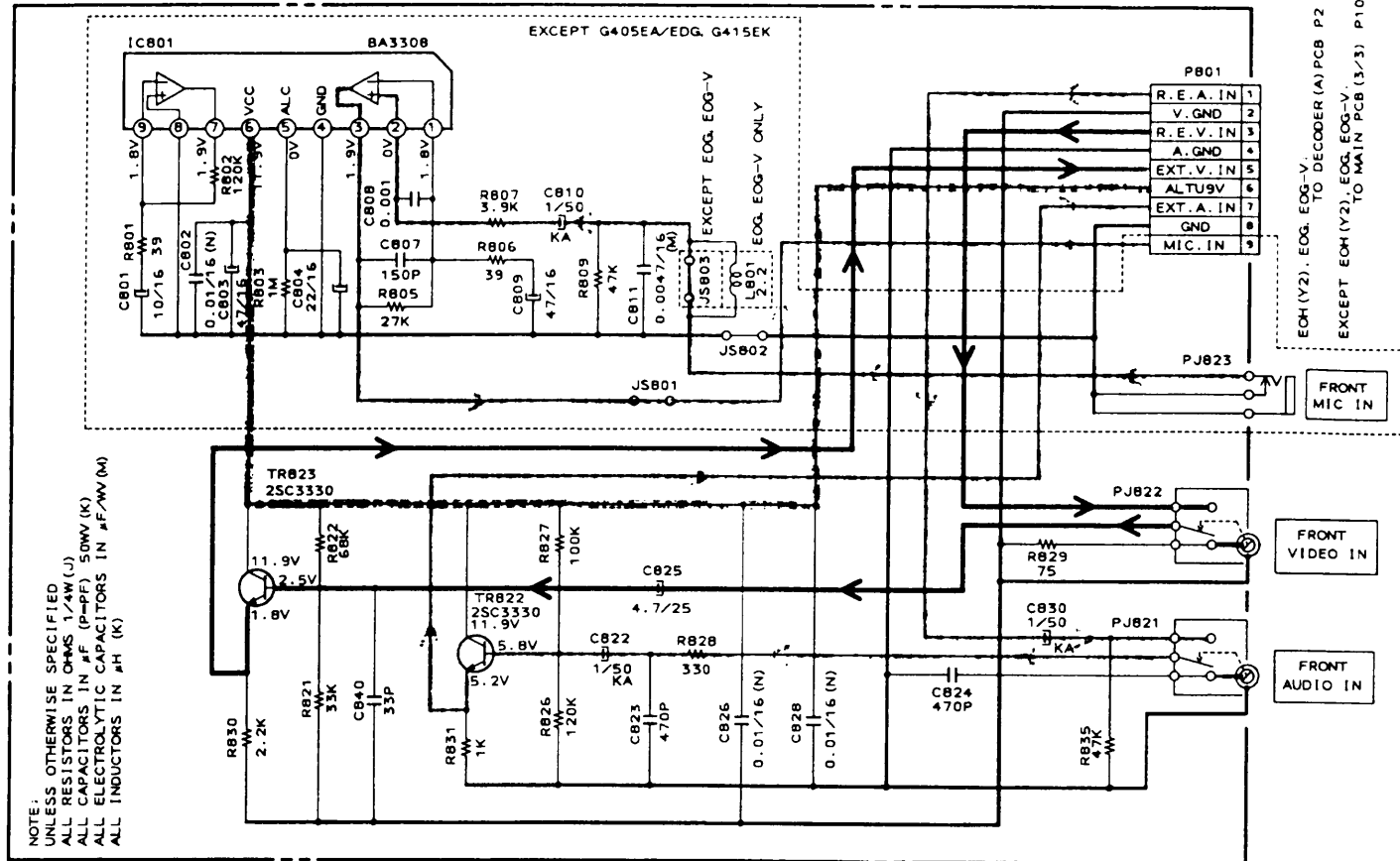
CDR Diagram

Decoder Diagram



VS-G415E0H (Y2)  
VS-G417E0G  
VS-G418E0G-V  
DECODER

Front End Diagram

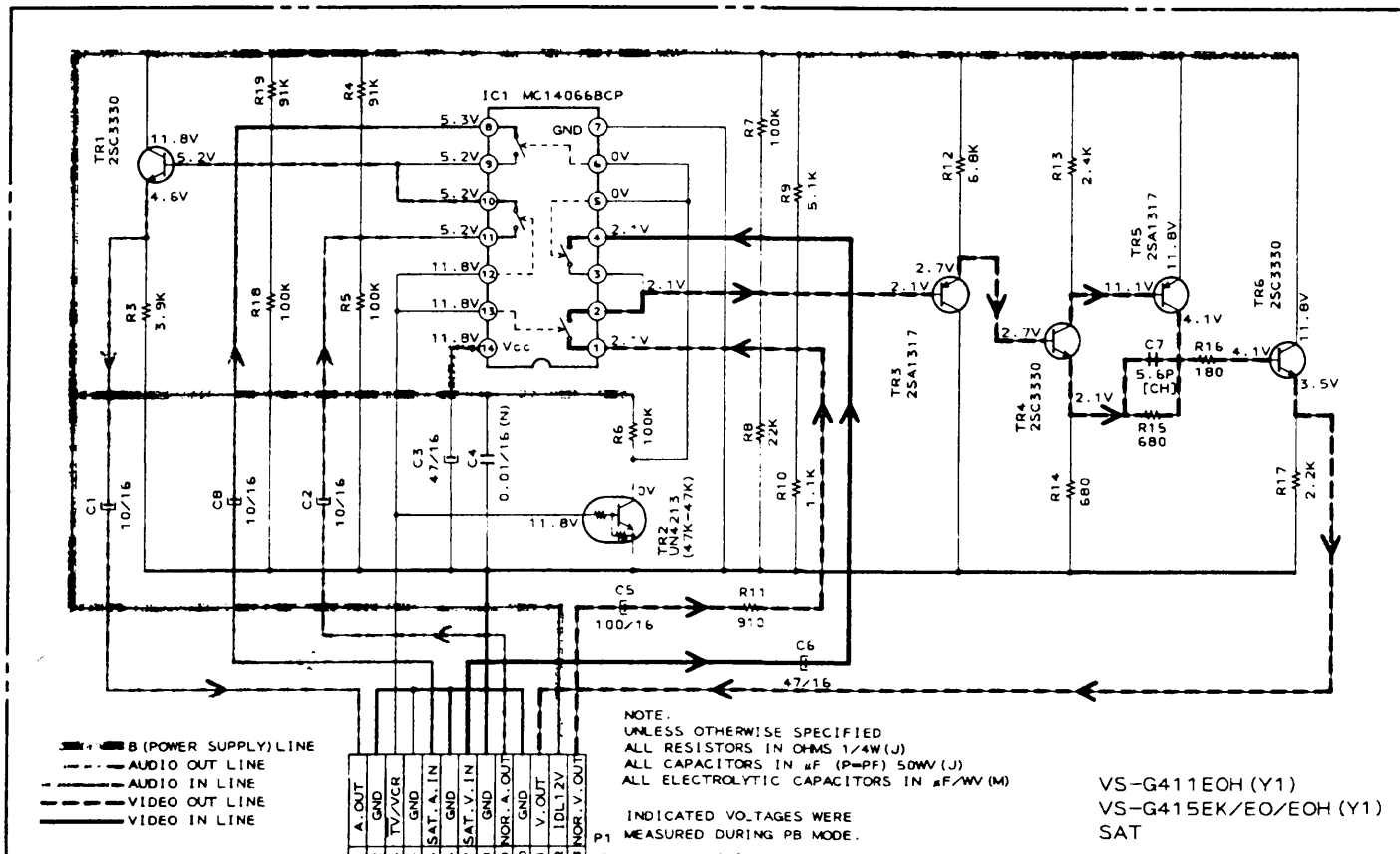


FRONT PCB V1188A5020

INDICATED VOLTAGES WERE MEASURED DURING E-E (STOP) MODE.

INDICATED VOLTAGES WERE MEASURED DURING E-E (STOP) MODE.

SAT Diagram



SAT PCB V1188A5030

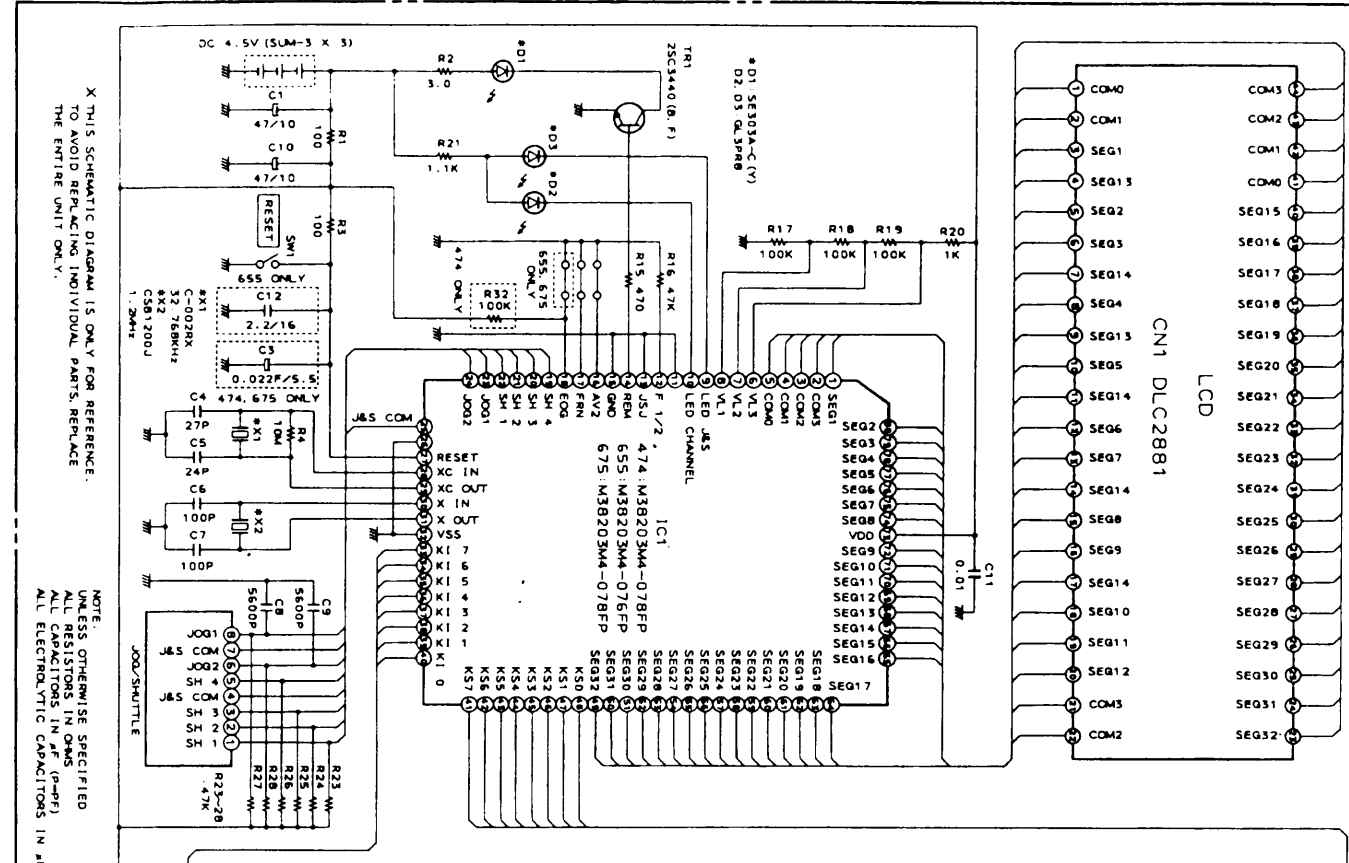
TO MAIN PCB (3/3)

NOTE: UNLESS OTHERWISE SPECIFIED ALL RESISTORS IN OHMS 1/4W(J) ALL CAPACITORS IN μF (P-PF) 50WV(J) ALL ELECTROLYTIC CAPACITORS IN μF/WV(M)

INDICATED VOLTAGES WERE MEASURED DURING PB MODE.

VS-G411EOH (Y1)  
VS-G415EK/EO/EOH (Y1)  
SAT

Remote Control Diagram

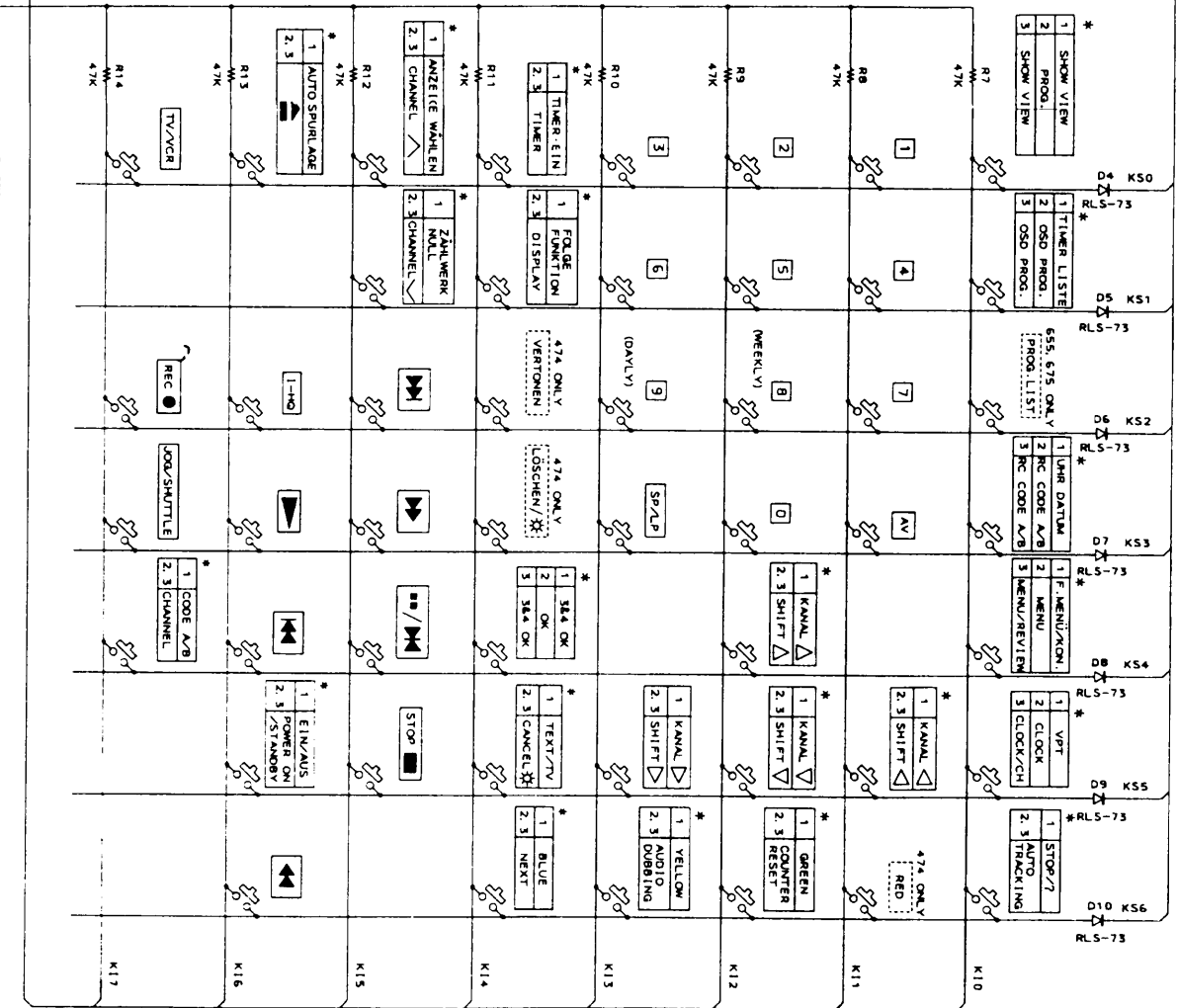


NOTE: UNLESS OTHERWISE SPECIFIED ALL RESISTORS IN OHMS (P-PF) ALL CAPACITORS IN μF (P-PF) 50WV(M) ALL ELECTROLYTIC CAPACITORS IN μF/WV(M)

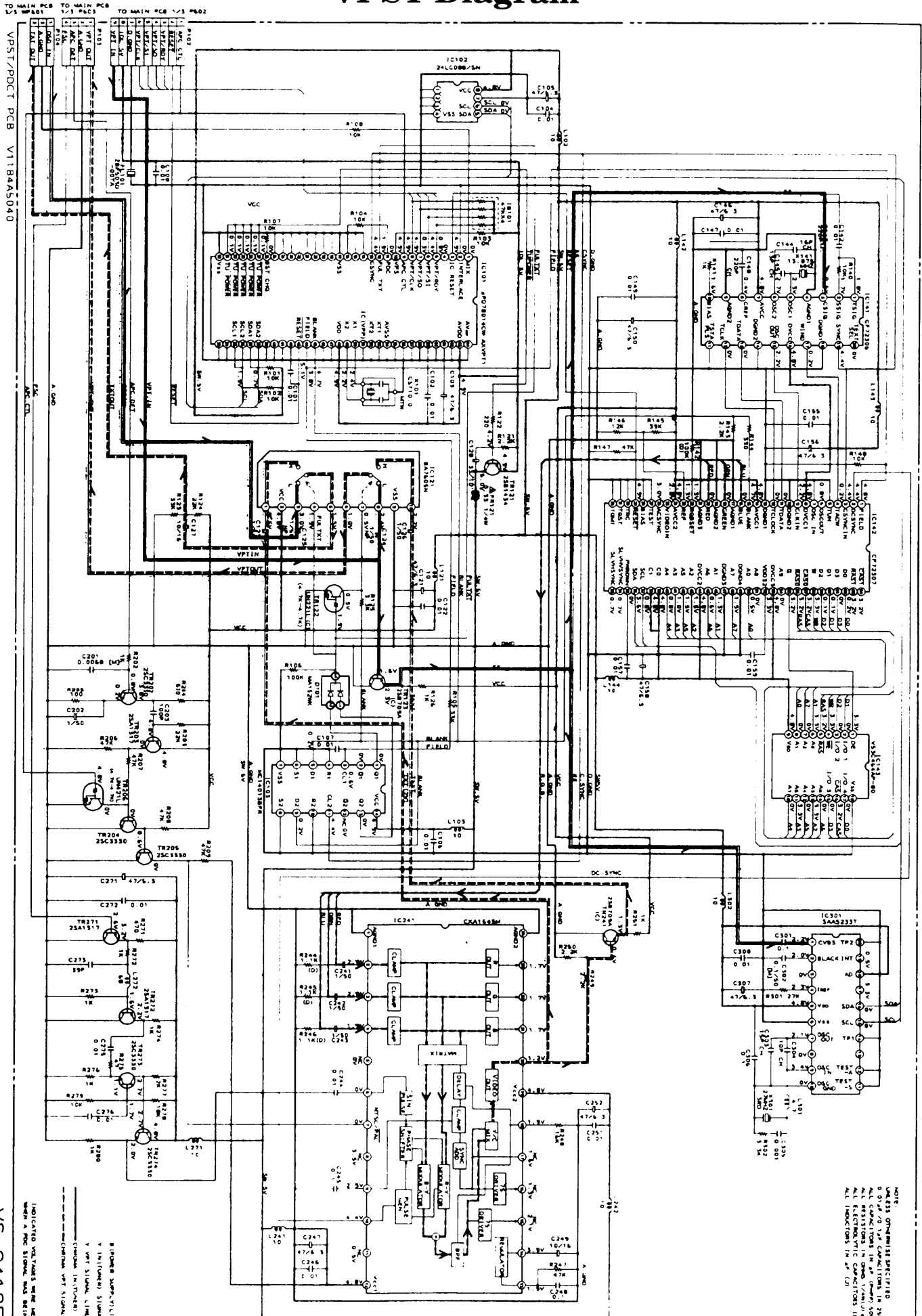
RC-W474, W655, W675  
REMOTE CONTROL UNIT

\*BUTTON NAME DIFFERENCES

1	FOR RC-W474
2	FOR RC-W655
3	FOR RC-W675

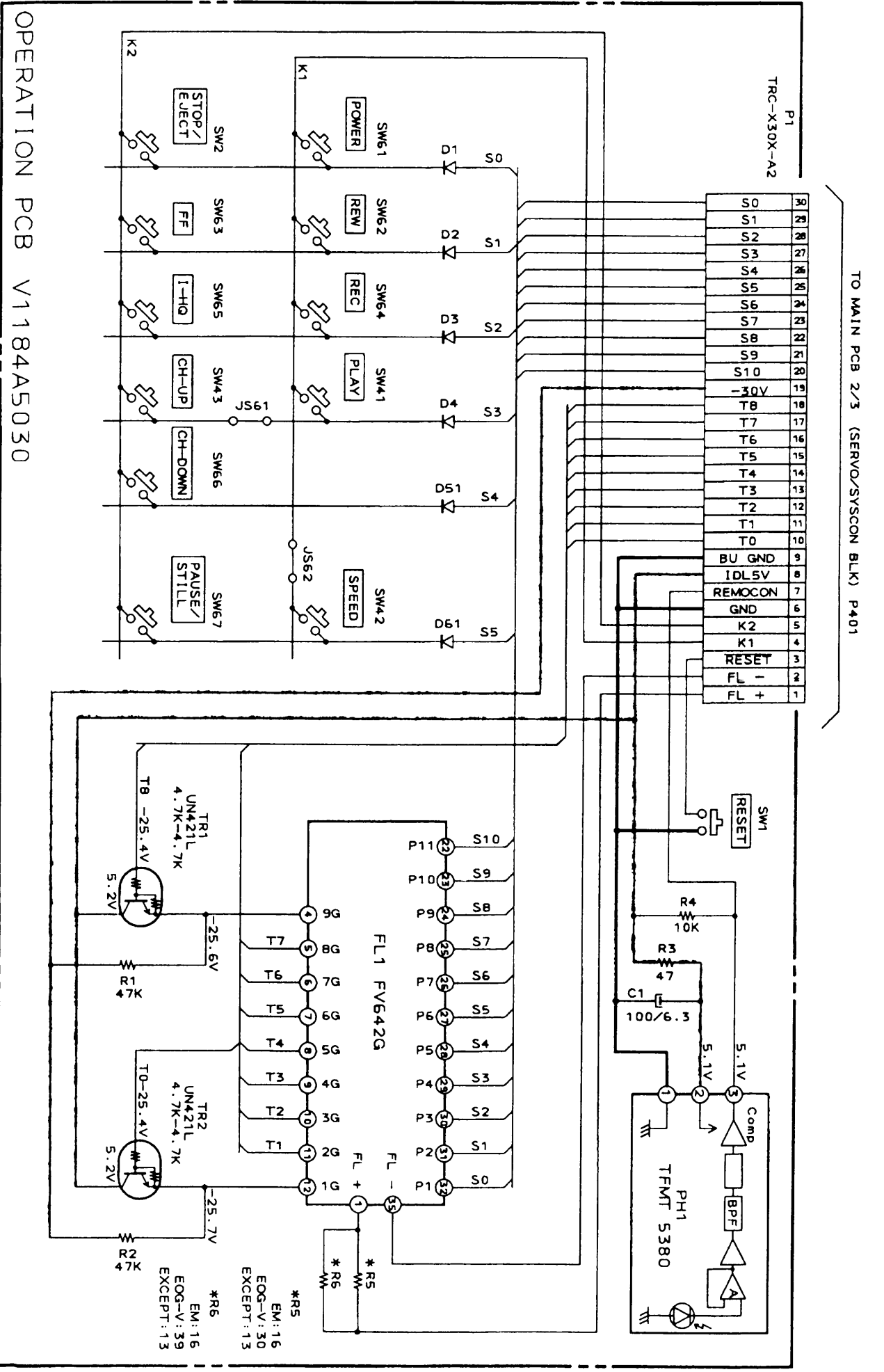


VPST Diagram



VS-G418EOG-V  
VPST

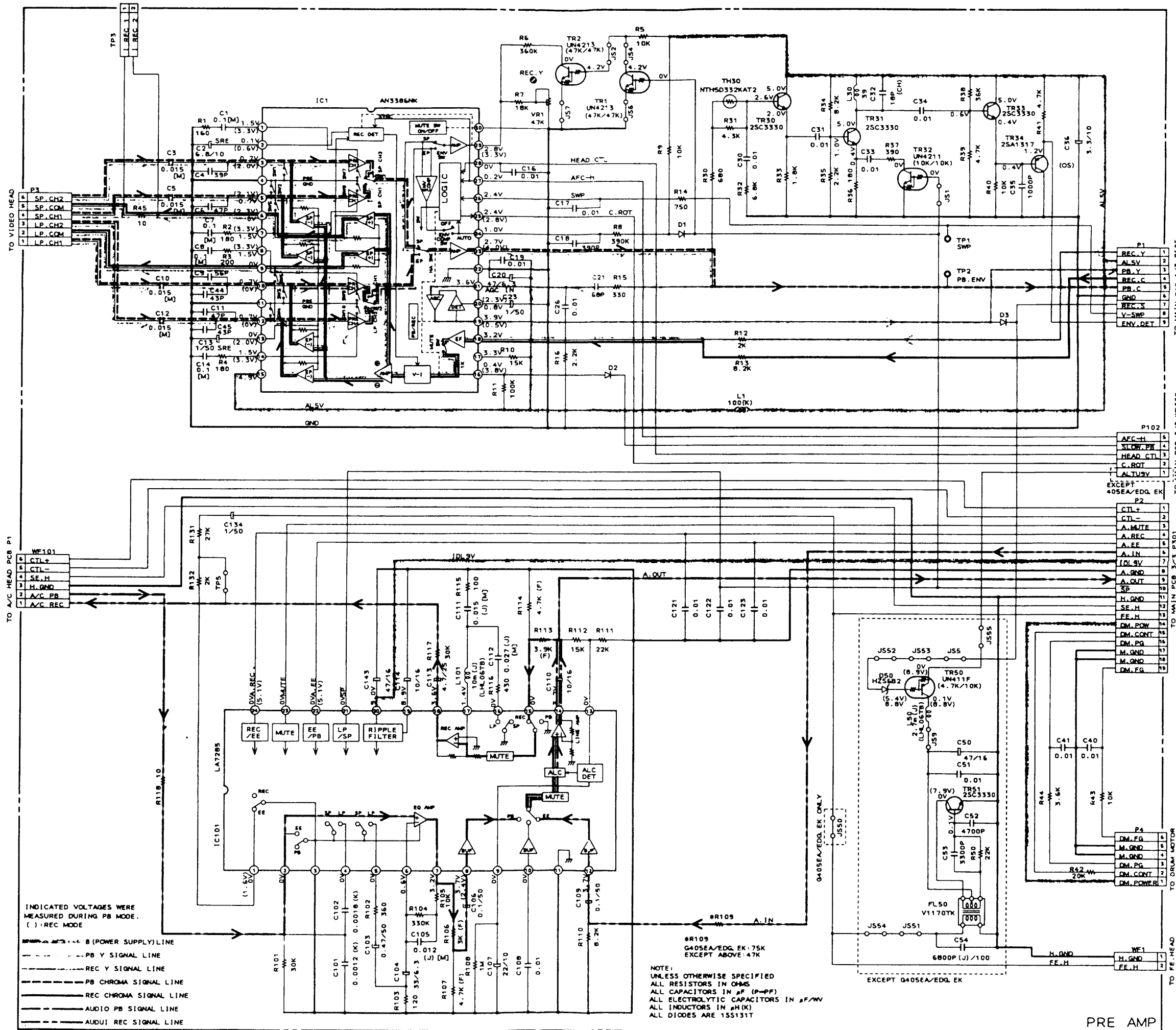
Operations Diagram



B (POWER SUPPLYLINE)  
INDICATED VOLTAGES WERE  
MEASURED DURING PB MODE.

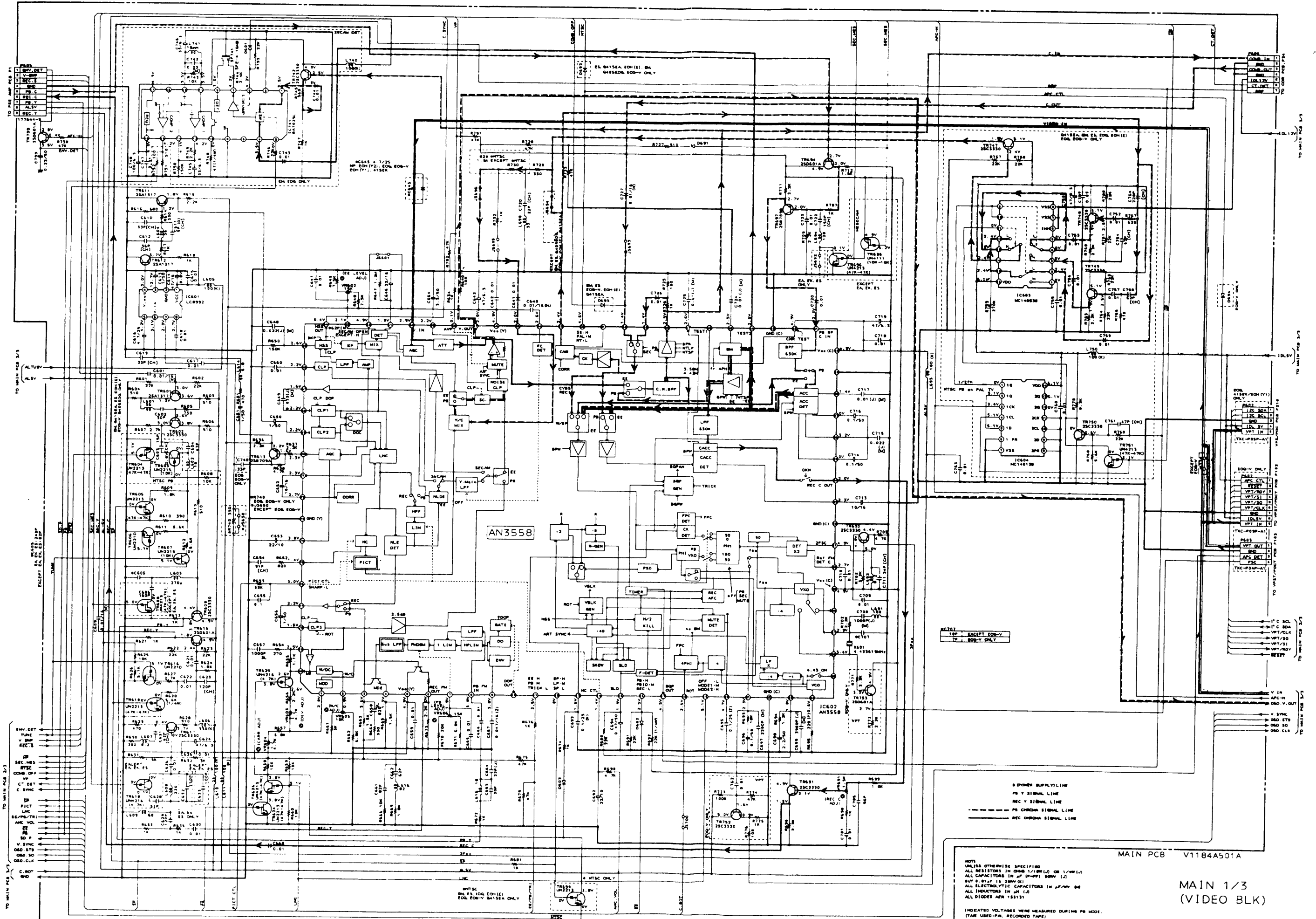
NOTE:  
UNLESS OTHERWISE SPECIFIED  
ALL RESISTORS IN OHMS 1/4W (J)  
ALL CAPACITORS IN  $\mu$ F (P-PP)  
ALL ELECTROLYTIC CAPACITORS IN  $\mu$ F/WV (M)  
ALL DIODES IS 1SS131T-77

Pre Amp Diagram



PRE AMP

Main Diagram 1/3



- POWER SUPPLY LINE  
 - PS V SIGNAL LINE  
 - REC V SIGNAL LINE  
 - PS CHROMA SIGNAL LINE  
 - REC CHROMA SIGNAL LINE

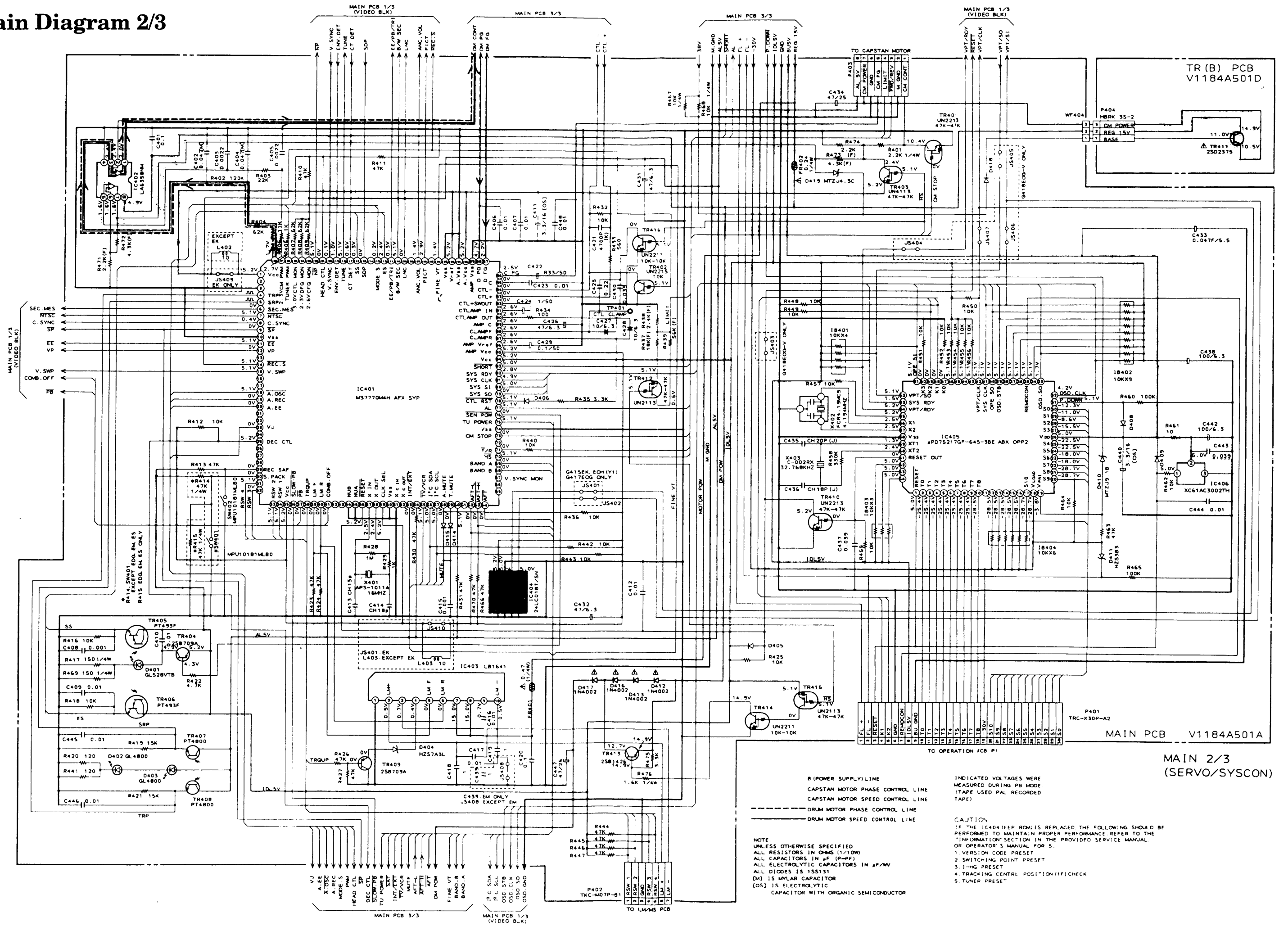
NOTE:  
 UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS IN OHMS (1/100 (Ω) OR 1/10 (Ω))  
 ALL CAPACITORS IN μF (100 (μF) OR 10 (μF))  
 BUT 0.1 μF IS 100 (nF)  
 ALL ELECTROLYTIC CAPACITORS IN μF (100 μF)  
 ALL INDUCTORS IN μH (10 μH)  
 ALL DIMENSIONS IN MILLIMETERS (1/16")

INDICATED VOLTAGES WERE MEASURED DURING PB MODE.  
 (TAP USED - PAL RECORDED TAPE)  
 (INDICATED VOLTAGES IN THE NTSC PLAYBACK SECTION)  
 WERE MEASURED DURING NTSC 4.43 MODE.

MAIN PCB V1184A501A

MAIN 1/3 (VIDEO BLK)

Main Diagram 2/3



**TO OPERATION PCB P1**

**MAIN PCB V1184A501A**

**MAIN 2/3 (SERVO/SYSCON)**

**TR(B) PCB V1184A501D**

**CAUTION**

IF THE IC404 EEPROM IS REPLACED, THE FOLLOWING SHOULD BE PERFORMED TO MAINTAIN PROPER PERFORMANCE REFER TO THE "INFORMATION" SECTION IN THE PROVIDED SERVICE MANUAL OR OPERATOR'S MANUAL FOR S.

- VERSION CODE PRESET
- SWITCHING POINT PRESET
- 1-HZ PRESET
- TRACKING CENTRE POSITION (1F) CHECK
- TUNER PRESET

**NOTE**

UNLESS OTHERWISE SPECIFIED  
 ALL RESISTORS IN OHMS (1/10W)  
 ALL CAPACITORS IN μF (P-P-F)  
 ALL ELECTROLYTIC CAPACITORS IN μF/WV  
 ALL DIODES IS 1S5131  
 [M] IS MYLAR CAPACITOR  
 [OS] IS ELECTROLYTIC CAPACITOR WITH ORGANIC SEMICONDUCTOR

**LEGEND:**

- (POWER SUPPLY) LINE
- CAPSTAN MOTOR PHASE CONTROL LINE
- CAPSTAN MOTOR SPEED CONTROL LINE
- - - DRUM MOTOR PHASE CONTROL LINE
- DRUM MOTOR SPEED CONTROL LINE

**INDICATED VOLTAGES WERE MEASURED DURING PB MODE (TAPE USED PAL RECORDED TAPE)**



Main Diagram 3/3

