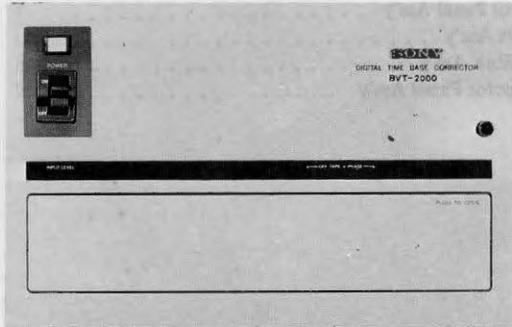


SONY[®]

DIGITAL TIME BASE CORRECTOR

BVT-2000



OPERATION AND MAINTENANCE MANUAL

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1-1. FEATURES

Correction range of 4 Hp-p to 12 Hp-p

The memory built into the model can be used to correct time base errors up to a maximum of 4Hp-p in the VTR output. Moreover, by combining it with the optional dynamic tracking memory circuit board, time base errors up to 12 Hp-p (addition of one memory circuit board) can be corrected.

Also, if the above correction range is exceeded, the BVT-2000 output has no horizontal movement (break-up) or sync fluctuations.

Wide range dynamic tracking playback

When combined with the model BVH-1100 VTR equipped with a dynamic tracking mechanism, the model allows dynamic tracking playback from one-fourth the rated speed in the rewind direction to twice the rated speed in the forward direction. (This form of playback is also known as guard band noise-less playback.)

In this case, the optional dynamic tracking memory circuit board is required.

Built-in 9-bit analog-digital converter

The BVT-2000 processes the video signals by converting the analog signals to the 9-bit digital signals. With this system, S/N deterioration of the VTR playback signal which is caused by using the TBC can practically be ignored.

Clock frequency four times the value of subcarrier frequency

The clock frequency required to convert the video signals into digital data is selected to four times the subcarrier frequency and so a K factor of less than 1% and a flat frequency response up to 4.2 MHz are obtained without taxing the signal processing functions in any way.

1 H prior dropout compensation with digital Y/C separation

Thanks to the provision of a digital dropout compensator, the dropout section can be replaced by a 1 H prior signal featuring a high signal correlation.

Since 1 H prior dropout compensation displays a higher correlation of the signals in the replaced section than 2 H prior dropout compensation, the dropout compensation effect is greatly improved. Furthermore, since digital Y/C separation is employed for the dropout compensation, a high stability is yielded and there is no need to adjust the gain or phase.

Synchronizes to external reference signals with high and low speed tape playback

The BVT-2000 can synchronize the VTR output to external reference signals and produce stable color while the tape is set to the fast forward, rewind or slow motion/still playback if the tape is traveling at not more than 10 times faster or slower than the normal tape speed.

Built-in velocity error compensation

The phase error is continuously compensated for within each line due to the inclusion of the built-in velocity error compensator.

The BVT-2000 is also equipped with a unique high-speed automatic phase control (APC) which, in company with the velocity error compensator, helps to keep the residual phase errors down to within ± 2.5 nsecs for color signals.

Built-in sync generator

The built-in sync generator can be gen locked to external reference video signals, or composite sync signals, subcarrier by setting the switch to the proper position when required.

When the gen lock signals are not connected, sync is generated automatically by the internal source.

Picture improvement functions

As outlined below, the BVT-2000 features a number of picture improvement functions.

- Cable compensation
The cable compensation circuit built into the input video circuit enables deterioration to the frequency response caused by the cable to be compensated.
- Differential gain compensation
Differential gain produced by the VTR can be linearly compensated for across a range of $\pm 8\%$.
- Differential phase compensation
Differential phase produced by the VTR can be linearly compensated for across a range of $\pm 8^\circ$.
- Chrominance noise reduction
By providing a line adding mode in the chroma system, the signal-to-noise ratio in the chroma system can be improved.

Built-in video processor

The video level, chroma level, set up level, hue level, system subcarrier phase and the system sync phase can all be adjusted with the built-in video processor.

Shaping during the vertical blanking period

Unnecessary video signals in the vertical blanking period can be selected at any line unit and replaced by pedestal potential.

Built-in automatic advanced sync generator

An automatic advanced sync generator is self-contained and this automatically controls the advanced sync phase which is fed out to the VTR so that the phase of the playback video signals is brought to the center of the correction range while the BVH-1000 or BVU-100 and BVU-200A is being employed.

This means that there is no need to align the advanced sync phase when changing over tapes.

Attachable adapter for heterodyne color VTRs (option)

It is also possible to attach an adapter (BK-2003) which converts playback signals from a heterodyne color VTR without a subcarrier input connector into standard broadcasting signals.

1-2. SPECIFICATIONS

1-2-1. General

Power requirements	AC 100/120/220/240 V $\pm 10\%$, selectable 48 - 64 Hz
Power consumption	620 W
Operating temperature	0°C - 40°C
Humidity	10% - 90% (non condensed)
Weight	40 kg (88 lbs)

1-2-2. Video

Band width	± 0.3 dB to 4.2 MHz
Signal to noise ratio (unweighted)	58 dB
Differential gain	2%
Differential phase	2°
K-factor (2T Pulse & bar)	1%
Correction range	± 2 H (without BK-2001) ± 6 H (with BK-2001)
Residual error	Color: ± 2.5 nsec Monochrome: ± 15 nsec
Chrominance/Luminance delay	20 nsec

1-2-3. Input signals

Off tape video	NTSC composite video, sync negative 1.0 Vp-p ± 3 dB, 75 ohms
Reference video or sync and subcarrier	1.0 Vp-p ± 3 dB, 75 ohms, ON/OFF 4.0 Vp-p ± 3 dB, 75 ohms, ON/OFF 1.0 Vp-p +6, -3 dB, 75 ohms, ON/OFF
Dropout compensator reference signal	Dropout pulse, TTL level (for BVH-1000/1100) (Dropout: Low) High impedance or off tape RF signal, 0.5 Vp-p ± 3 dB, 75 ohms (for BVU-200A, BVU-100)
Remote in	High impedance
* Off tape (video) (pin 1, pin 2)	NTSC composite video, sync negative 1.0 Vp-p ± 3 dB, 50 ohms
* DT-V (pin 3, pin 4)	TTL level, High impedance
* Off tape mode (pin 5)	TTL level, High impedance Off tape = High
* DOC pulse (pin 6, pin 7)	TTL level (Dropout: low)
* Play status (pin 8)	TTL level, High impedance Play status = High
* REC sync	TTL level, High impedance
* Confidence mode (pin 12)	TTL level, High impedance Confidence = Low
* Ω connect (pin 14)	TTL level, High impedance Ω connect = Low

* DT mode (pin 15) TTL level, High impedance
Dynamic tracking = Low

* Color framing pulse (pin 16) TTL level, High impedance

* These signals are the inputs from the Multiple connector. (Multiple connector video input takes priority of the BNC connector video input.)

1-2-4. Output signals

Video-1	} 1.0 Vp-p composite video 75 ohms, sync negative
Video-2	
Video-3	1.0 Vp-p composite video sync negative 0.7 Vp-p non-composite video 75 ohms

Advanced sync 4.0 Vp-p ± 0.8 Vp-p
composite sync, 75 ohms

Subcarrier (to U-matic only) 1.0 Vp-p ± 0.2 Vp-p, 75 ohms

Remote out The same signal out with remote in

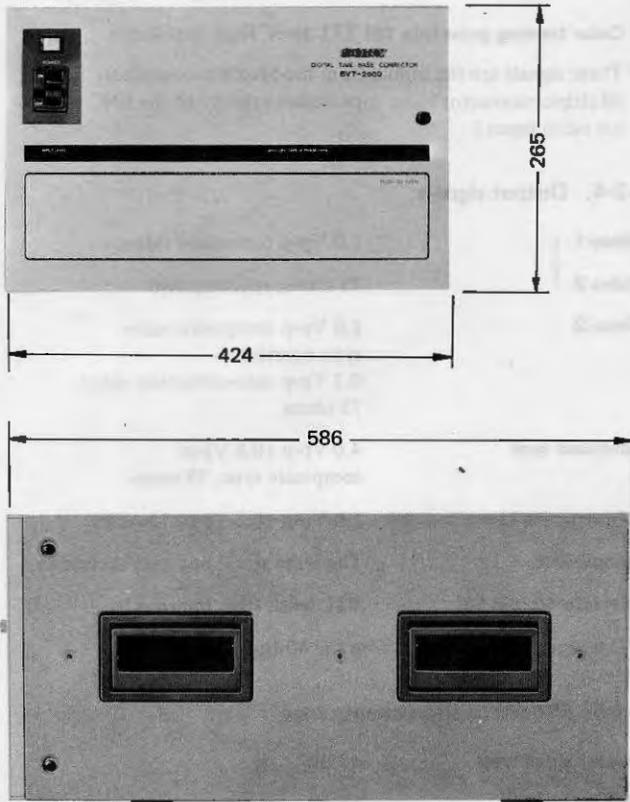
* fH (pin 10, pin 11) TTL level, High impedance

* This signal is the outputs from the Multiple connector.

1-2-5. Processor adjustment range

Output video level	± 3 dB
Chroma level	± 3 dB
Set up level	0~15 IRE
Hue	$\pm 15^\circ$
System sc phase	360° p-p
System sync phase	± 3 micro sec.
Video phase	± 560 nsec p-p (280 nsec/step)
DG	$\pm 8\%$
DP	$\pm 8^\circ$

Dimensions



1-3. INSTALLATION INSTRUCTIONS

1-3-1. Installation location

- Install the BVT-2000 in a location which is dry and well ventilated.
- Do not install in a room with a high temperature or near a heat source.
- Avoid installation in dusty areas or areas which are subjected to vibration.
- Avoid areas where high electric or magnetic fields are to be found.
- Avoid areas where the BVT-2000 will be exposed to direct sunlight, other strong lights or flashes of light.

1-3-2. Installation conditions

- Ensure that a gap of at least 30 cms is left between the rear connector panel and any adjacent surface.
- Do not bring cables or any other objects into contact with the metal netting of the rear panel ventilator.
- Bear in mind the following points when rack mounting.
Do not install the BVT-2000 over any power supplies or other equipment which radiates heat.
When mounting equipment into the same rack below the BVT-2000, leave a clearance of at least 3 cms between the units.

1-3-3. Pre-operational check list

- 1) Confirm that the VOLTAGE SELECTOR on the connector panel is set to the line voltage of your area.
- 2) Check that the POWER switch is at the OFF position.
- 3) Install the BVT-2000 in a rack or location which meets the conditions outlined above.
- 4) Check the input and output lines.
- 5) Open the front control panel and check that all the printed circuit boards have been inserted correctly.
Check that the board location number (at the bottom) tallies with the board number (grip part).
- 6) Turn the POWER switch on, and set all the controls, variable resistors and switches to their proper positions in accordance with the instructions given later in this manual.

1-4. OPERATION CONTROLS

1-3-4. Operating precautions

1) Blinking of POWER or INPUT LEVEL lamps

If the temperature inside the BVT-2000 rises to an abnormally high level, then the above lamps will blink. Operation under these conditions can lead to equipment failure. Immediately carry out the following inspection:

- Check for a high ambient temperature.
- Check the rear fan grille, and ensure that it is not blocked with dust.
- Check the ventilator fan to see if it is rotating properly.
- Check the installation location for abnormalities.

If, after checking and inspection for faults and malfunctions, the cause of the temperature rise cannot be pinpointed, switch off the power immediately and consult the Sony broadcasting services.

2) Inserting and removing the printed circuit boards

As a rule, avoid inserting and removing the printed circuit boards. However, when such an operation is absolutely necessary, observe the following important points.

- Always make sure that the power is off when inserting and removing the boards.
- When inserting the boards, always check that their slot number (at the bottom of the frame) tallies with the board number (grip section), and always insert in the proper location.
- Before turning on the power, check the position of the boards for a second time.

If the above instructions are not followed, the circuitry may be damaged.

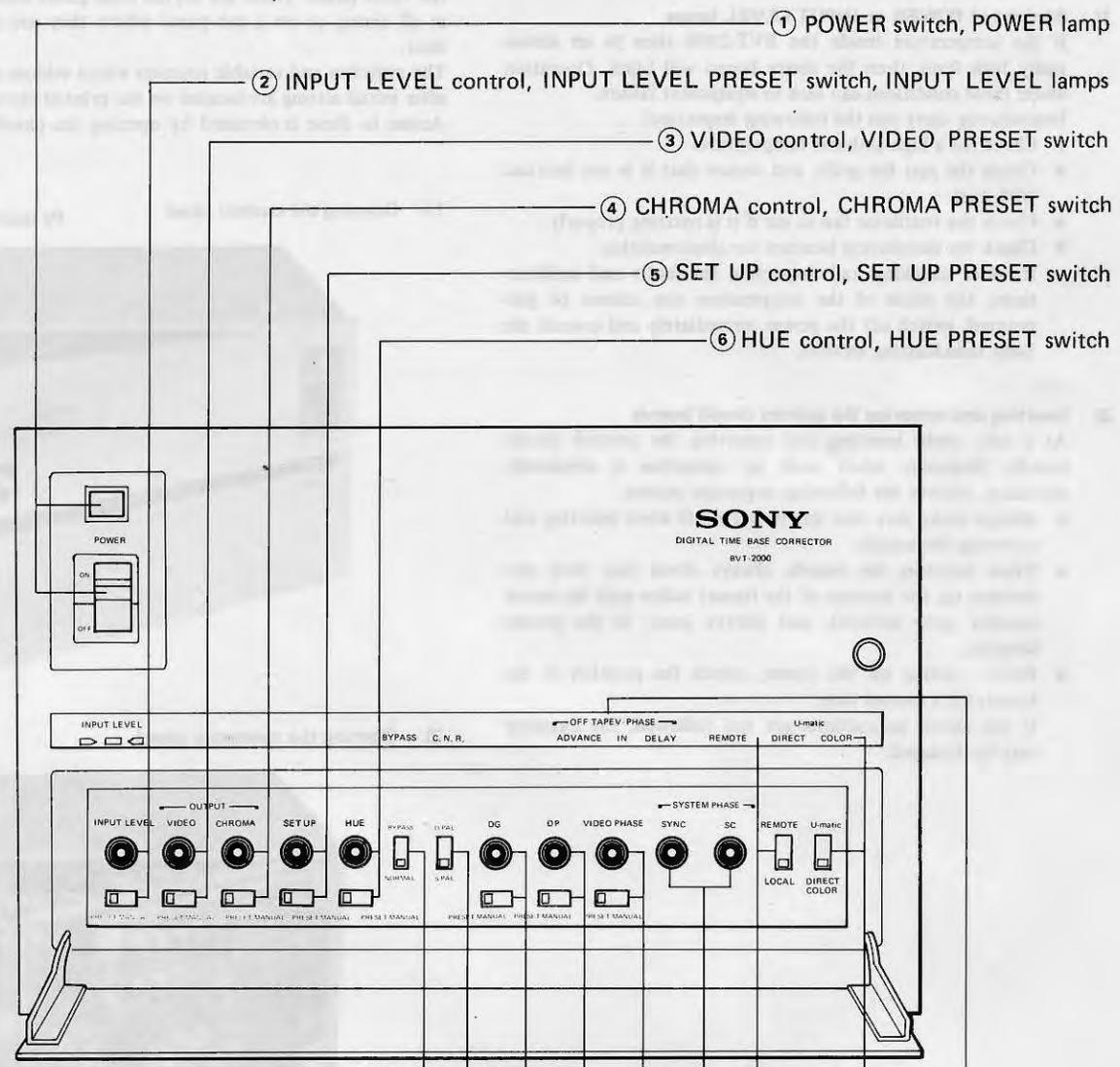
1) Opening the control panel



2) Opening the connector panel



1-4-1. Control panel



- ① POWER switch, POWER lamp
- ② INPUT LEVEL control, INPUT LEVEL PRESET switch, INPUT LEVEL lamps
- ③ VIDEO control, VIDEO PRESET switch
- ④ CHROMA control, CHROMA PRESET switch
- ⑤ SET UP control, SET UP PRESET switch
- ⑥ HUE control, HUE PRESET switch

- ⑦ NORMAL/BYPASS switch, BYPASS lamp
- ⑧ CNR ON/OFF switch, CNR lamp
- ⑨ DG control, DG PRESET switch
- ⑩ DP control, DP PRESET switch
- ⑪ VIDEO PHASE control, VIDEO PHASE PRESET switch
- ⑫ SYSTEM SYNC PHASE control, SYSTEM SC PHASE control
- ⑬ LOCAL/REMOTE switch, REMOTE lamp
- ⑭ DIRECT COLOR/U-matic switch, DIRECT COLOR/U-matic lamp
- ⑮ OFF TAPE V-PHASE lamps

① **POWER switch, POWER lamp**

When the POWER switch is turned on, the POWER lamp lights up and power is supplied to the circuitry. If the temperature inside the BVT-2000 should rise to an unusually high level (because of a ventilator breakdown, for instance), the POWER and INPUT LEVEL lamps will blink on and off. Search for the cause of the malfunction as described in "Blinking of POWER or LEVEL INPUT lamps" under section 1-3.

② **INPUT LEVEL control, INPUT LEVEL PRESET switch, INPUT LEVEL lamps**

MANUAL: The INPUT LEVEL control can be used to set the A/D converter's input level.

- When the left red lamp lights up, this means that the input level is low and that the S/N ratio is unfavorable.
- The center green lamp lights up to indicate the best possible setting.
- The right red lamp shows that there is a possibility that the high level component may be clipped due to overloading. Detection of the level depends on the VTR's sync level and not on the signal content.

PRESET: The TBC input amp gain is set to the reference level regardless of the position of this control.

③ **VIDEO control, VIDEO PRESET switch**

MANUAL: This enables the ⑬ VIDEO-1, ⑭ VIDEO-2 and ⑮ VIDEO-3 (described from now as the TBC output) video level to be adjusted within a range of ± 3 dB.

PRESET: The TBC output video level is set to the reference level regardless of the position of this control.

④ **CHROMA control, CHROMA PRESET switch**

MANUAL: This control allows the TBC output chroma level to be adjusted within a range of ± 3 dB.

PRESET: The TBC output chroma level is set to the reference level regardless of the position of this control.

⑤ **SET UP control, SET UP PRESET switch**

MANUAL: This control allows the TBC output set up level to be adjusted within a range from 0 to 15 IRE units of the reference level.

PRESET: The TBC output set up level is set to the reference level regardless of the position of this control.

⑥ **HUE control, HUE PRESET switch**

MANUAL: This control allows the TBC output hue level (burst and chroma relative phase) to be adjusted across a range of $\pm 15^\circ$.

PRESET: The TBC output hue level is set to the reference level regardless of the position of this control.

⑦ **NORMAL/BYPASS switch, BYPASS lamp**

NORMAL: A time-compensated output appears in the TBC output.

BYPASS: A bypassed output appears in the TBC output, and the BYPASS lamp comes on.

⑧ **CNR ON/OFF switch, CNR lamp**

ON: The video signals are Y/C separated, and only the chroma signal is line added to the IH prior signal and averaged. The chroma S/N ratio is thereby improved by 3 dB.

OFF: The video signal bypasses the above processing system.

⑨ **DG control, DG PRESET switch**

MANUAL: This control is used to linearly compensate the differential gain of the TBC output across a range of $\pm 8\%$.

PRESET: The differential gain bypasses the above processing system.

⑩ **DP control, DP PRESET switch**

MANUAL: This control is used to linearly compensate the differential phase of the TBC output across a range of $\pm 8^\circ$.

PRESET: The differential phase bypasses the above processing system.

⑪ **VIDEO PHASE control, VIDEO PHASE PRESET switch**

MANUAL: This control is used to move the video phase of the TBC output within a range of 900 nsec p-p (1 step = 280 nsec).

PRESET: The TBC output video phase is set to the reference level regardless of the position of this control.

⑫ **SYSTEM SYNC PHASE control, SYSTEM SC PHASE control**

These two controls are used when you want to adjust the SYNC phase and the SC phase of the TBC output with respect to the BVT-2000's reference input.

For instance, they can be used to bring the output phase in line with the station's reference, or when two or more VTRs and TBCs are being used to produce fades, lap-dissolve and special effects.

- The SYSTEM SYNC PHASE adjustable range is ± 3 μ sec.
- The SYSTEM SC PHASE adjustable range is 360° p-p.

There is usually virtually no need to move these two controls when performing ordinary maintenance work after the BVT-2000P has been installed in the studio, etc.

In cases like this, the phase may undergo a great change when they are touched in error if the variation range is too great and so by partially remodeling the ST-8 printed circuit board, the variable range of the control panel's SYSTEM SYNC PHASE and SYSTEM SC PHASE controls can be reduced to about one-tenth of their normal range. The remaining nine-tenths are adjusted with the vrs on the ST-8 printed circuit board.

⑬ **LOCAL/REMOTE switch, REMOTE lamp**

LOCAL: All the controls and switches are operated on the front panel of the BVT-2000.

REMOTE: Operation is provided by the controls and switches on the optional remote control unit for TBC applications regardless of the positions of the controls and switches on the BVT-2000 front panel.

The REMOTE lamp comes on.

⑭ **DIRECT COLOR/U-matic switch, DIRECT COLOR/U-matic lamp**

DIRECT COLOR: Set the switch to this position when combining the BVT-2000 with a direct color VTR (such as Sony's BVH-1100). The DIRECT COLOR lamp comes on.

U-matic: Set the switch to this position when combining the BVT-2000 with a U-matic VTR (such as Sony's BVU-200A or 100). The U-matic lamp comes on.

15 OFF TAPE V-PHASE lamps

When producing time base correction ranges of ± 2 H and ± 6 H, it is first necessary to have one or two 8-line memory boards, respectively. (Only one board is provided with the model and the other boards are available as options BK-2001.) In addition, the phase of the VTR playback output must be advanced 4 H or 8 H, respectively, as average values ahead of the TBC output phase. If the phase advance does not tally with these values, there is no change in the width of the correction range at 4 Hp-p and 8 Hp-p, but the center value of the correction shifts and so it appears that the correction range is correspondingly narrower.

This point is important especially when the correction range is to be made as wide as possible such as with dynamic tracking playback or rolling tape playback. If the playback output phase shifts from the correction range, this will be translated into a shift in the picture with the TBC output in the vertical direction.

The OFF TAPE V-PHASE lamps enable the VTR playback output phase to be checked to see if it is properly advanced ahead of the TBC output phase.

ADVANCE: Lights up when the VTR output phase has been advanced too far ahead.

IN: Lights up when the VTR output phase is correctly positioned.

DELAY: Lights up when the VTR output phase is delayed.

When the BVH-500 or BVH-1100 is being employed, the VTR output phase is designed to be correct without a special signal having to be sent from the TBC to the VTR.

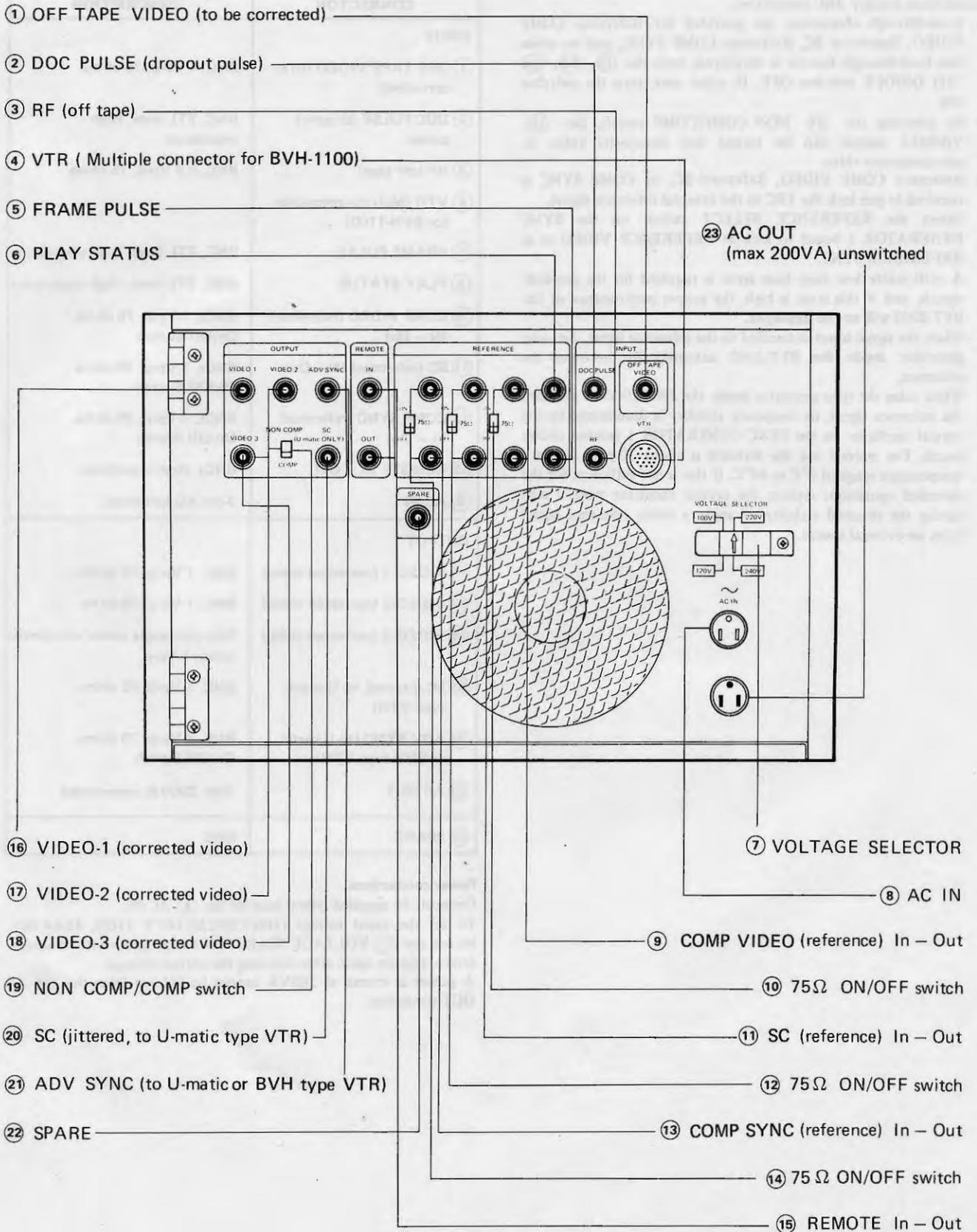
Therefore, when these VTRs are being used and the ADVANCE or the DELAY lamp lights up, it is necessary to check on an oscilloscope whether the TBC correction range is sufficient for the fluctuation in the VTR output phase or whether the average VTR output phase is centered in the correction range.

If the phase is not correct, adjust the switch inside the VTR.

Furthermore, the VTR output phase will not be correct unless some action is taken, when the BVH-1000, BVU-100 or BVU-200A is being operated. Therefore, it is necessary to send an advanced sync signal from the TBC to the VTR and apply the vertical sync of the VTR with this signal.

This particular time base corrector has a built-in circuit which automatically controls the advanced sync phase so that the above VTR playback phase is brought properly into the center of the correction range. This means that it is no longer necessary to align the advance sync phase as it was with conventional time base correctors when changing the tape. (Manual operations are also possible using the internal selector switch.)

1-4-2. Connector panel



Use the CCY cables supplied with the TBC for the connections between the VTR and TBC. All the other input and output signal connections employ BNC connectors.

- Loop-through connectors are provided for Reference COMP VIDEO, Reference SC, Reference COMP SYNC, and so when this loop-through feature is employed, turn the ⑩, ⑫, ⑭ 75Ω ON/OFF switches OFF. In other uses, turn the switches ON.
- By selecting the ⑲ NON COMP/COMP switch, the ⑱ VIDEO-3 output can be turned into composite video or non-composite video.
- Reference COMP VIDEO, Reference SC, or COMP SYNC is required to gen lock the TBC to the external reference signal. Select the REFERENCE SELECT switch on the SYNC GENERATOR 1 board to lock at REFERENCE VIDEO or at REFERENCE SYNC.

A sufficiently low time base error is required for the gen-lock signals, and if this error is high, the proper performance of the BVT-2000 will not be displayed.

When the signal is not connected to the reference input, the sync generator inside the BVT-2000 automatically becomes the reference.

When using the sync generator inside the BVT-2000 to generate the reference signal, its frequency stability is determined by the crystal oscillator on the SYNC GENERATOR 1 printed circuit board. For normal use the stability is about 30 ppm across a temperature range of 0°C to 40°C. If this is not sufficient for the intended operation, replace the crystal oscillator with a unit having the required stability or apply a stable reference signal from an external source.

INPUT/OUTPUT connector specifications

CONNECTOR	DESCRIPTION
INPUT	
① OFF TAPE VIDEO (to be corrected)	BNC, 1 Vp-p, 75 ohms
② DOC PULSE (dropout pulse)	BNC, TTL level, High impedance
③ RF (off tape)	BNC, 0.5 Vp-p, 75 ohms
④ VTR (Multiple connector for BVH-1100)	
⑤ FRAME PULSE	BNC, TTL level, High impedance
⑥ PLAY STATUS	BNC, TTL level, High impedance
⑨ COMP VIDEO (reference) IN – Out	BNCs, 1 Vp-p, 75 ohms On/Off Switch
⑪ SC (reference) IN—Out	BNCs, 1 Vp-p, 75 ohms On/Off Switch
⑬ COMP SYNC (reference) In – Out	BNCs, 4 Vp-p, 75 ohms On/Off Switch
⑮ REMOTE In – Out	BNCs, High impedance
⑧ AC IN	3-pin AC connector
OUTPUT	
⑲ VIDEO-1 (corrected video)	BNC, 1 Vp-p, 75 ohms
⑰ VIDEO-2 (corrected video)	BNC, 1 Vp-p, 75 ohms
⑱ VIDEO-3 (corrected video)	Non composite video/ composite video, 1 Vp-p
⑳ SC (jittered, to U-matic type VTR)	BNC, 1 Vp-p, 75 ohms
㉑ ADV SYNC (to U-matic or BVH type VTR)	BNC, 4 Vp-p, 75 ohms On/Off Switch
㉓ AC OUT	max 200VA, unswitched
㉒ SPARE	BNC

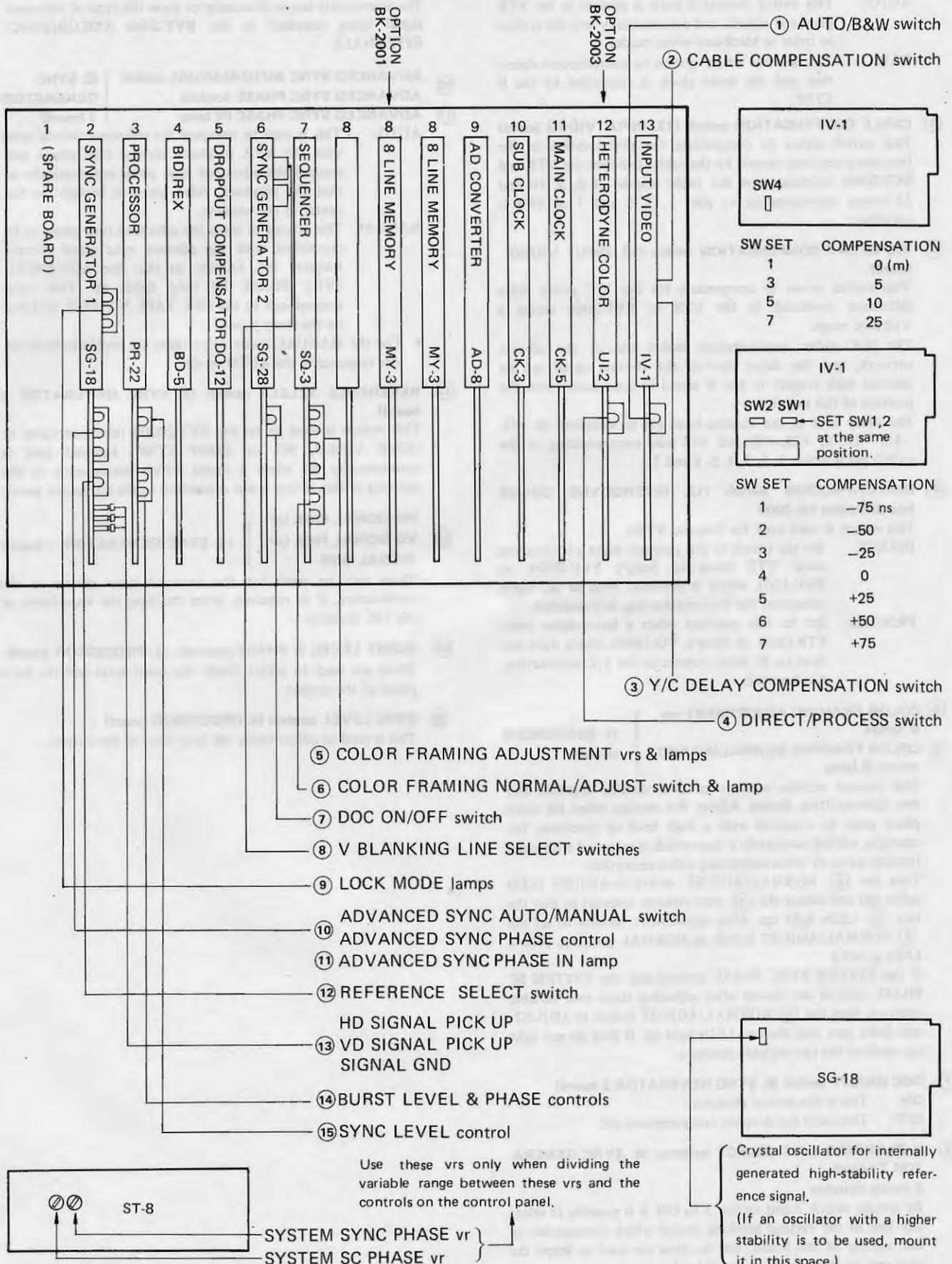
Power connections

Connect the supplied power cord to the ⑧ AC IN.

To set the input voltage (100/120/220/240 V ±10%, 48-64 Hz), loosen the ⑦ VOLTAGE SELECTOR's lock screw with a screwdriver. Tighten again after selecting the correct voltage.

A power in excess of 200VA cannot be fed out from the ㉓ AC OUT connector.

1-4-3. Printed circuit board



① **AUTO/B&W switch (13. INPUT VIDEO board)**

AUTO: This switch detects if burst is present in the VTR playback signals, and automatically sets the system to color or black-and-white mode.

B&W: This sets the whole system to monochrome operation and the write clock is controlled by the H SYNC.

② **CABLE COMPENSATION switch (13. INPUT VIDEO board)**

This switch serves to compensate for deterioration in the frequency response caused by the cables between the VTR and BVT-2000. Compensation for cable lengths of 0, 5, 10 and 25 meters corresponding to pins 1, 3, 5 and 7 of SW4 is available.

③ **Y/C DELAY COMPENSATION switch (13. INPUT VIDEO board)**

This switch serves to compensate for the Y/C group delay difference produced in the VTR or BVT-2000 across a ± 10 nsec range.

The Y/C delay compensation makes use of the all-pass network, and the delay time of the chroma signal can be selected with respect to the Y signal in accordance with the position of this switch.

The delay time in the chroma band can be switched to -75 , -50 , -25 , 0 , $+25$, $+50$, and $+75$ nsec corresponding to the switch pin position 1, 2, 3, 4, 5, 6 and 7.

④ **DIRECT/PROCESS switch (12. HETERODYNE COLOR board) Option BK-2003**

This switch is used only for U-matic VTRs.

DIRECT: Set the switch to this position when a heterodyne color VTR (such as Sony's BVU-200A or BVU-100), which is provided with an SC input connector for Y/C interleaving, is connected.

PROCESS: Set to this position when a heterodyne color VTR (such as Sony's VO-2860), which does not have an SC input connector for Y/C interleaving, is connected.

⑤ **COLOR FRAMING ADJUSTMENT vrs & lamps** } (7. SEQUENCER board)

⑥ **COLOR FRAMING NORMAL/ADJUST switch & lamp**

This control section consists of two variable resistors and two light-emitting diodes. Adjust this section when the color phase must be repeated with a high level of precision, for example, editing accurately a tape which is recorded with color framing servo, or when composing video animation.

Turn the ⑥ NORMAL/ADJUST switch to ADJUST (LED lights up) and adjust the ⑤ two variable resistors so that the two ⑤ LEDs light up. After adjustment, be sure to set the ⑥ NORMAL/ADJUST switch to NORMAL position. (The 3 LEDs go off.)

If the SYSTEM SYNC PHASE control and the SYSTEM SC PHASE control are turned after adjusting these two variable resistors, turn the ⑥ NORMAL/ADJUST switch to ADJUST, and make sure that the two LEDs light up. If they do not light up, readjust the two variable resistors.

⑦ **DOC ON/OFF switch (6. SYNC GENERATOR 2 board)**

ON: This is the normal position.

OFF: This turns the dropout compensation off.

⑧ **V BLANKING LINE SELECT switches (6. SYNC GENERATOR 2 board)**

8 circuit switches

By setting switch 2 and switch 3 to ON, it is possible to select any line in the vertical blanking period which corresponds to the number of the board, and so these are used to shape the lines and set them to the pedestal level.

⑨ **LOCK MODE lamps (3. SYNC GENERATOR 1 board)**

The appropriate lamps illuminate to show the type of reference signal being supplied to the BVT-2000 (COLOR/SYNC/INTERNAL).

⑩ **ADVANCED SYNC AUTO/MANUAL switch** } (3. SYNC GENERATOR 1 board)
⑪ **ADVANCED SYNC PHASE control**
⑪ **ADVANCED SYNC PHASE IN lamp**

AUTO: This is used to compare the reference vertical sync with the VTR playback vertical sync phase, and control the advanced sync phase automatically so that the playback video phase is brought to the center of the window.

MANUAL: This is used to allow the advanced sync phase to be controlled with the advance sync phase control trimmer vr3. (Adjust so that the ADVANCED SYNC PHASE IN lamp lights up. This lamp corresponds to the OFF TAPE V-PHASE IN lamp on the front panel.)

• Use the MANUAL mode when there are problems with the rise response in the AUTO mode.

⑫ **REFERENCE SELECT switch (3. SYNC GENERATOR 1 board)**

This switch is used to set the BVT-2000's reference signal to COMP VIDEO, SC, or COMP SYNC. Internal lock is automatically set when a signal which corresponds to the position of this switch is not connected to the connector panel.

HD SIGNAL PICK UP

⑬ **VD SIGNAL PICK UP** } (3. SYNC GENERATOR 1 board)
SIGNAL GND

These can be used for the external sync signals of the oscilloscope, if so required, when checking the wave-forms of the TBC sections.

⑭ **BURST LEVEL & PHASE controls (4. PROCESSOR board)**

These are used to adjust finely the burst level and the burst phase of the output.

⑮ **SYNC LEVEL control (4. PROCESSOR board)**

This is used to adjust finely the sync level of the output.

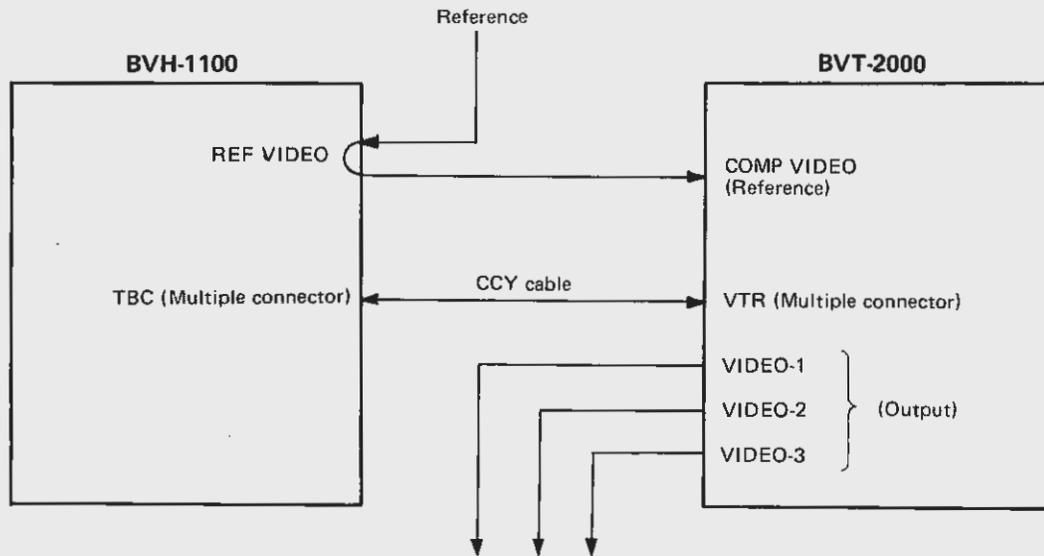
1-5. SIGNAL CONNECTIONS

The two most common operational modes of use are shown in the following diagrams.

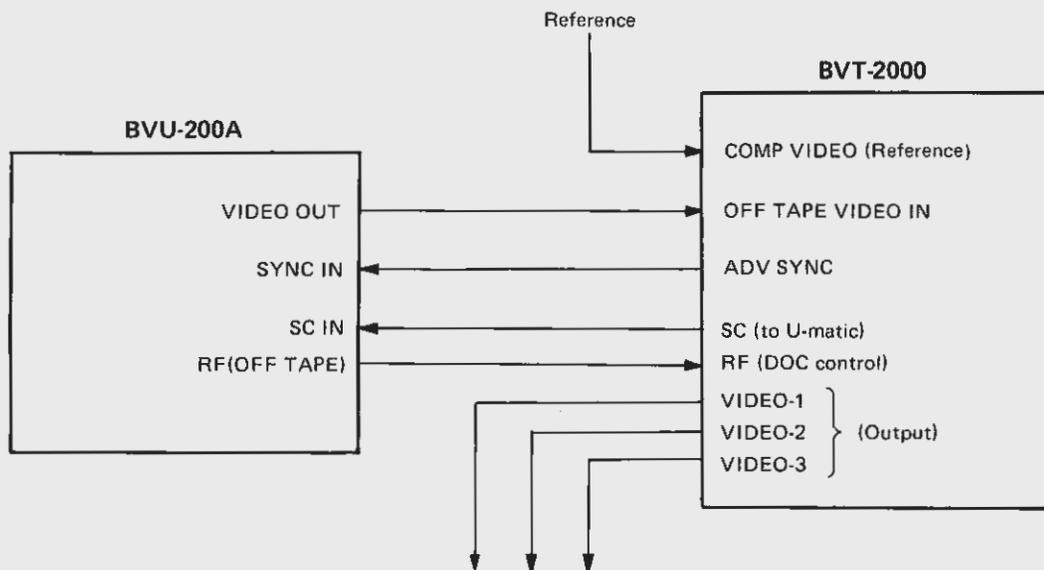
The required connections are clearly shown in each case.

Observe the advice and information concerning connectors and the printed circuit board switches given in section 1-4-3 "Printed circuit boards".

Connections with direct color VTR (BVH-1100)



Connections with heterodyne color VTR (BVU-200A)



1-6. OPTIONAL ADAPTOR AND ACCESSORIES

1-6-1. Dynamic tracking memory board BK-2001

When combining the BVT-2000 with the BVH-1000 for dynamic tracking playback (guard band noise-less playback), it is necessary to plug one optional memory board (same as MAIN MEMORY board of BVT-2000) into slot number 8 (16).

Whereas the correction range is 4 Hp-p with one MAIN MEMORY board, two boards expand this range to 12 Hp-p. It is also possible to yield proper pictures with dynamic tracking playback.

Using the MEMORY boards is effective when playing back a tape containing a great deal of jitter (for example, a tape which has been recorded on a portable U-matic while on the move). The vertical phase shift which is produced with a correction range of 4 Hp-p can be eliminated.

1-6-2. Heterodyne color VTR color processor BK-2003

Use this adapter when converting the playback signals of a heterodyne color VTR (VO-2860) without a subcarrier input connector into standard broadcasting signals, or when it is not possible to return the subcarrier signal to the VTR from the time base corrector with microcircuits even when a VTR, which is provided with a subcarrier input connector, is being employed.

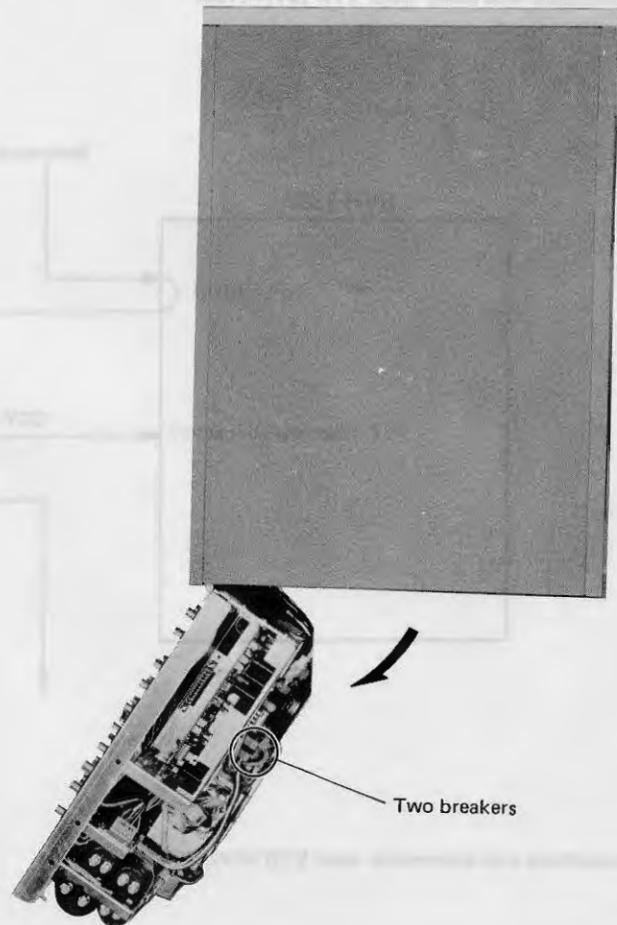
The adapter is configured as a single printed circuit board (called HETERODYNE COLOR), and it is inserted into the position marked by slot number 12 on the time base corrector.

For the above instances, set the DIRECT/PROCESS switch on the board to PROCESS, and for all other instances, set the switch to DIRECT.

1-7. BREAKERS

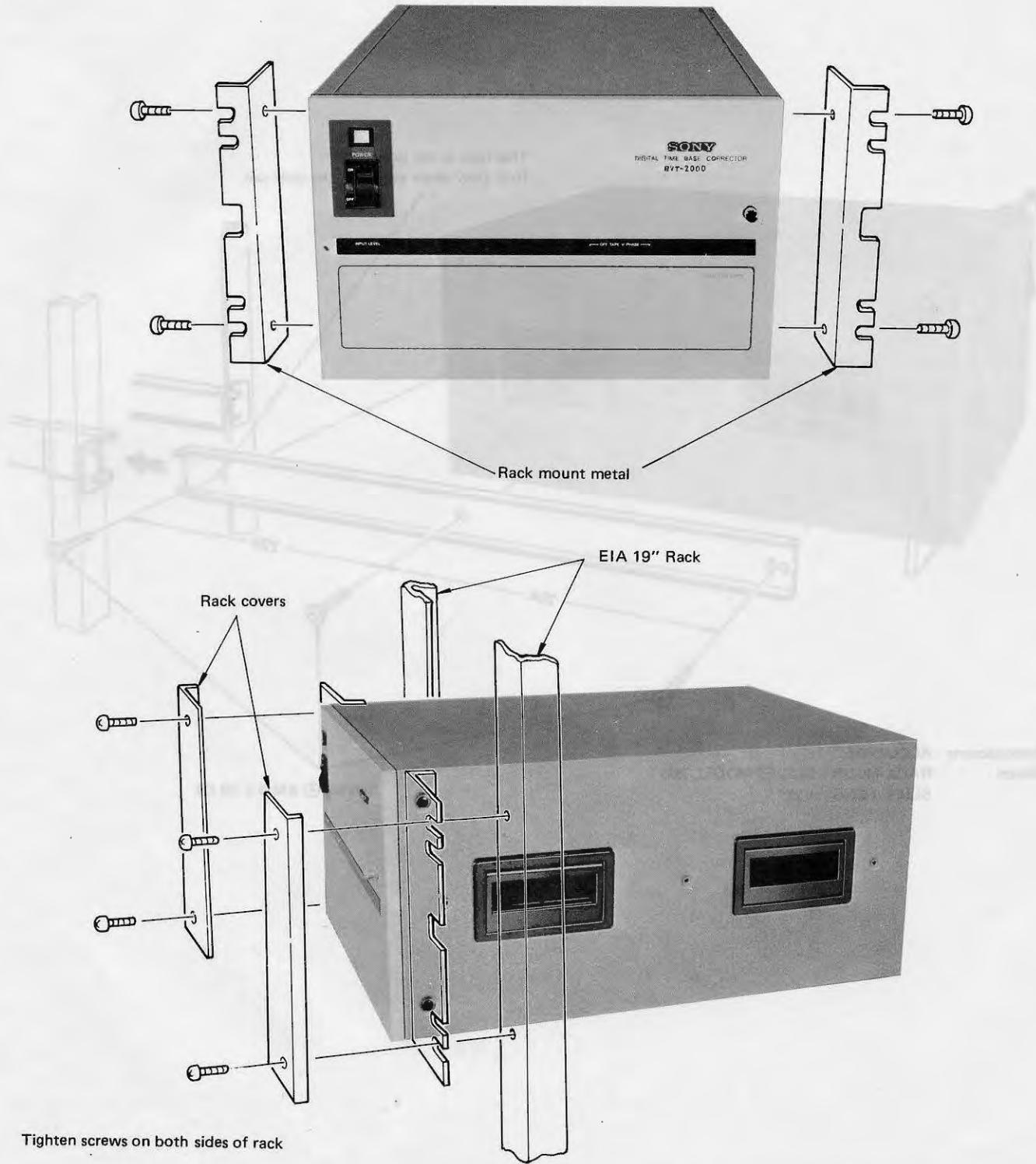
When no power is supplied to the BVT-2000, open the connector panel as in the photo below and inspect the two breakers.

If the breakers are OFF, set them to ON but if they return to OFF after power is supplied, inspect the power supply and the voltage. If nothing appears wrong, contact the Sony broadcasting services.

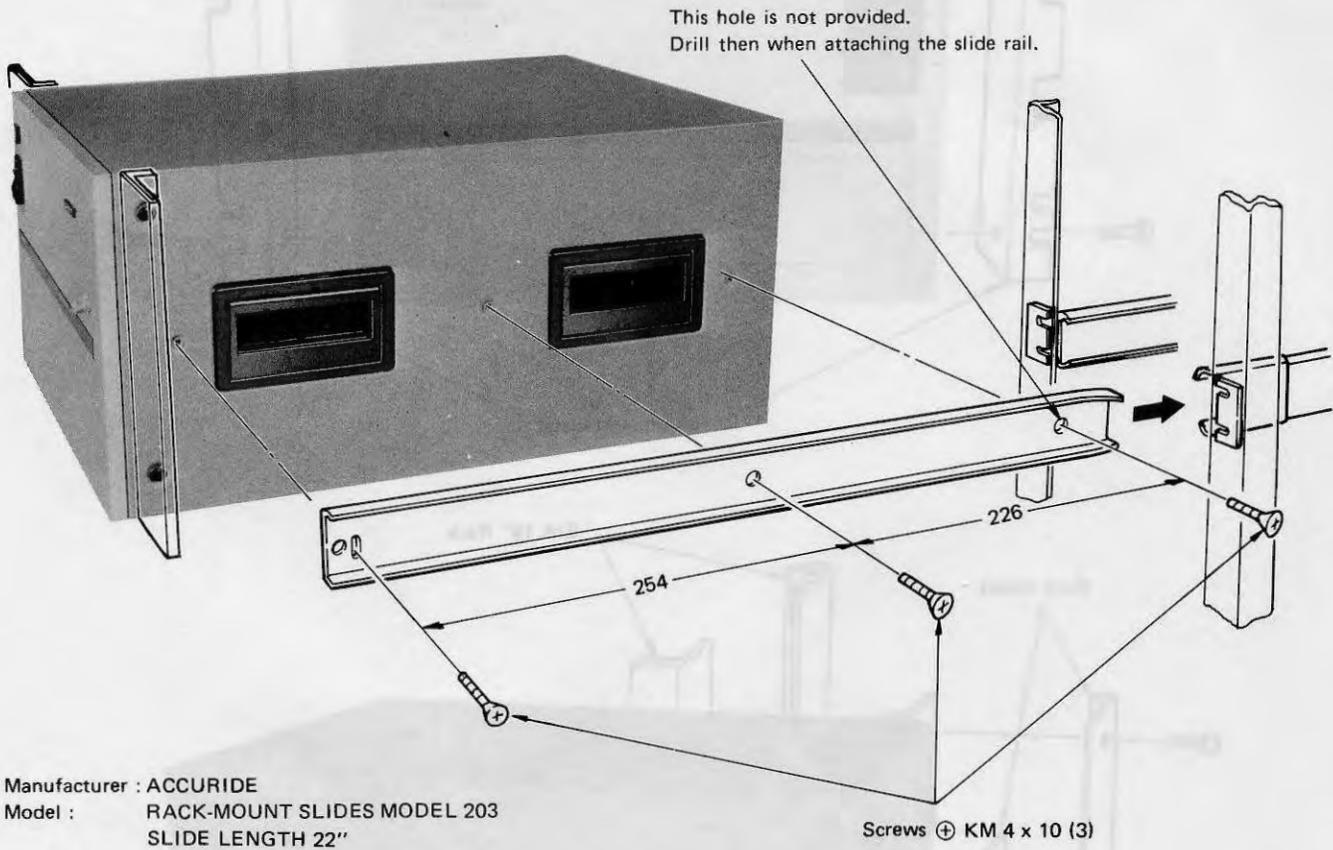


1-8. RACK MOUNTING

The BVT-2000 can be rack mounted in a standard 19-inch rack by attaching the rack mounting metals to the sides of the cabinet. Unscrew the screws on both sides (total of 4). Then secure the supplied rack-mounting metals with the original screws as shown in the photo below.



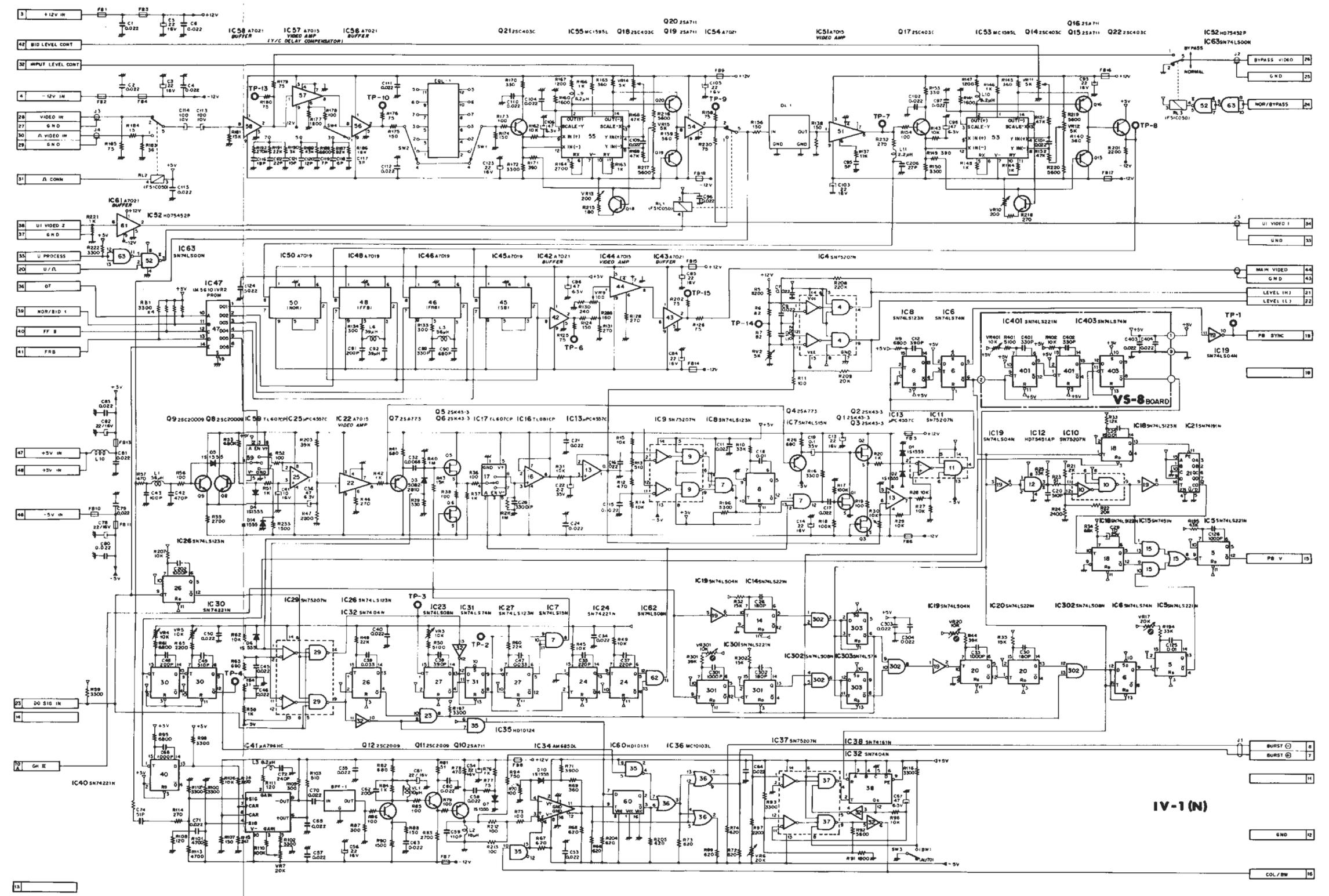
1-9. SLIDE RAIL MOUNTING



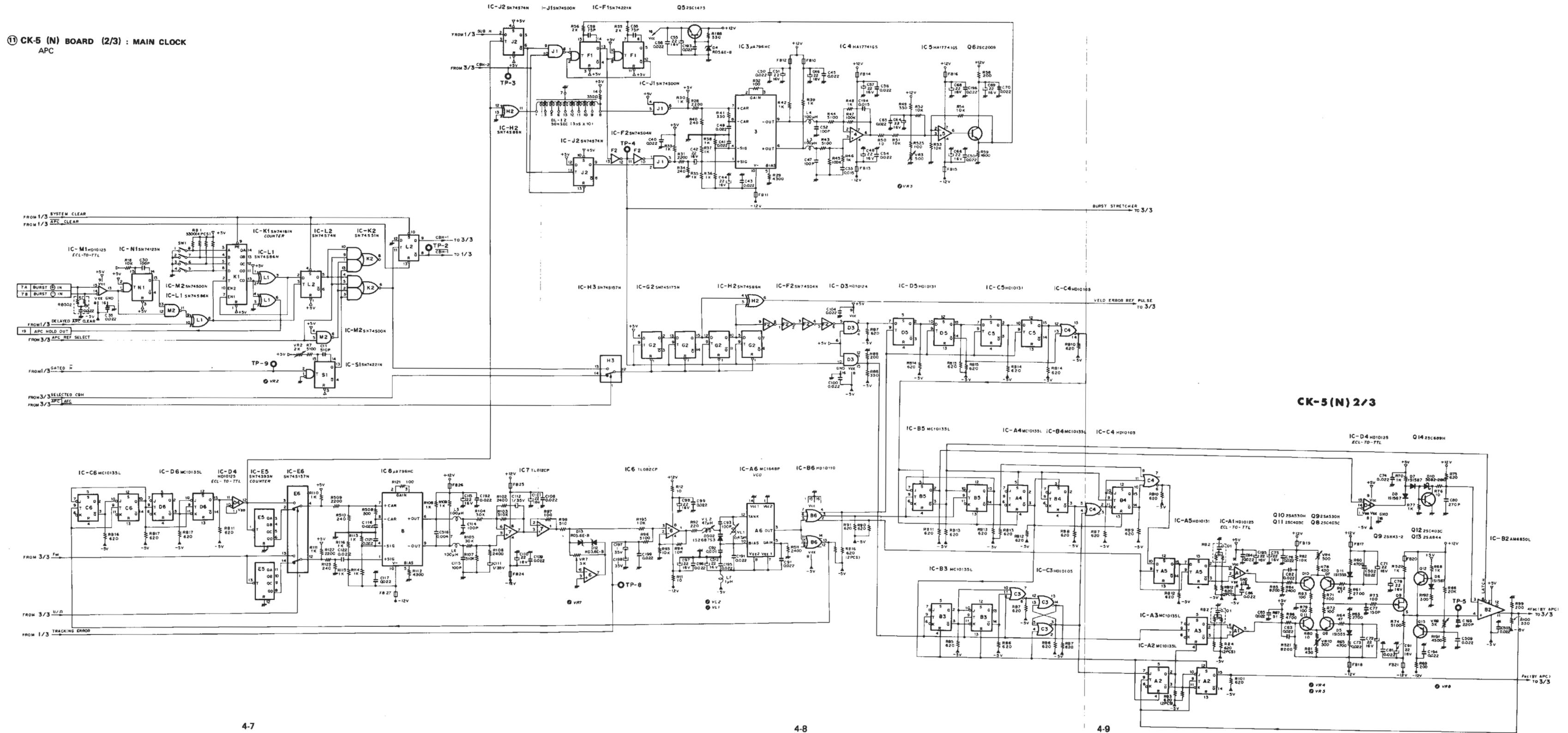
- When transporting the BVT-2000 with a car, be sure to mount it to the rack with the slide rails and rack mounting metals.
- In other cases, it is also recommended to mount the BVT-2000 to the rack with the slide rails and rack mounting metals for easier attachment, removal and servicing.

SECTION 4 SCHEMATIC DIAGRAMS

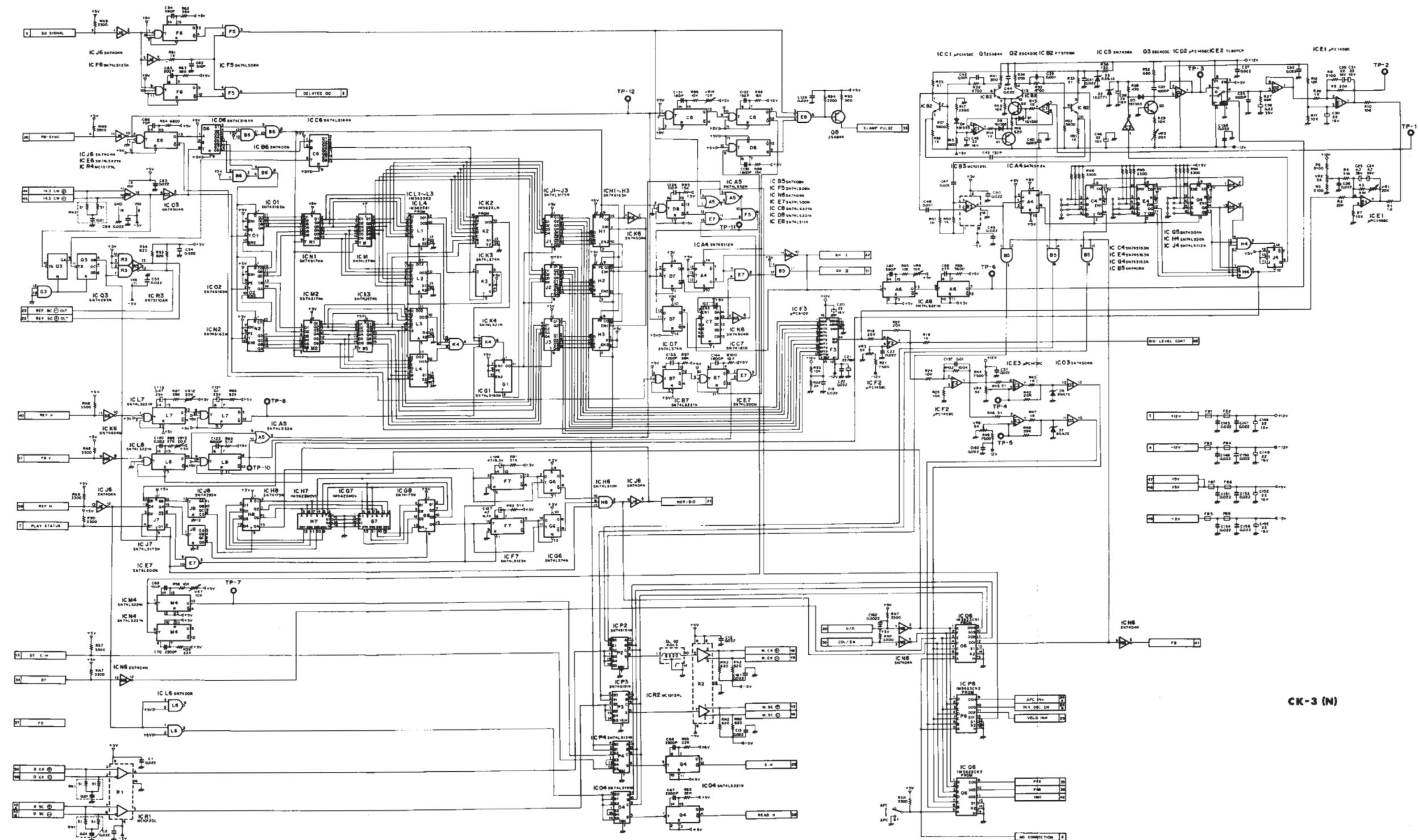
13 IV-1 (N) BOARD : INPUT VIDEO AMPLIFIER
CABLE COMPENSATOR
LEVEL CONTROL
SYNC SEPARATOR
BURST SEPARATOR



⑪ CK-5 (N) BOARD (2/3) : MAIN CLOCK
APC

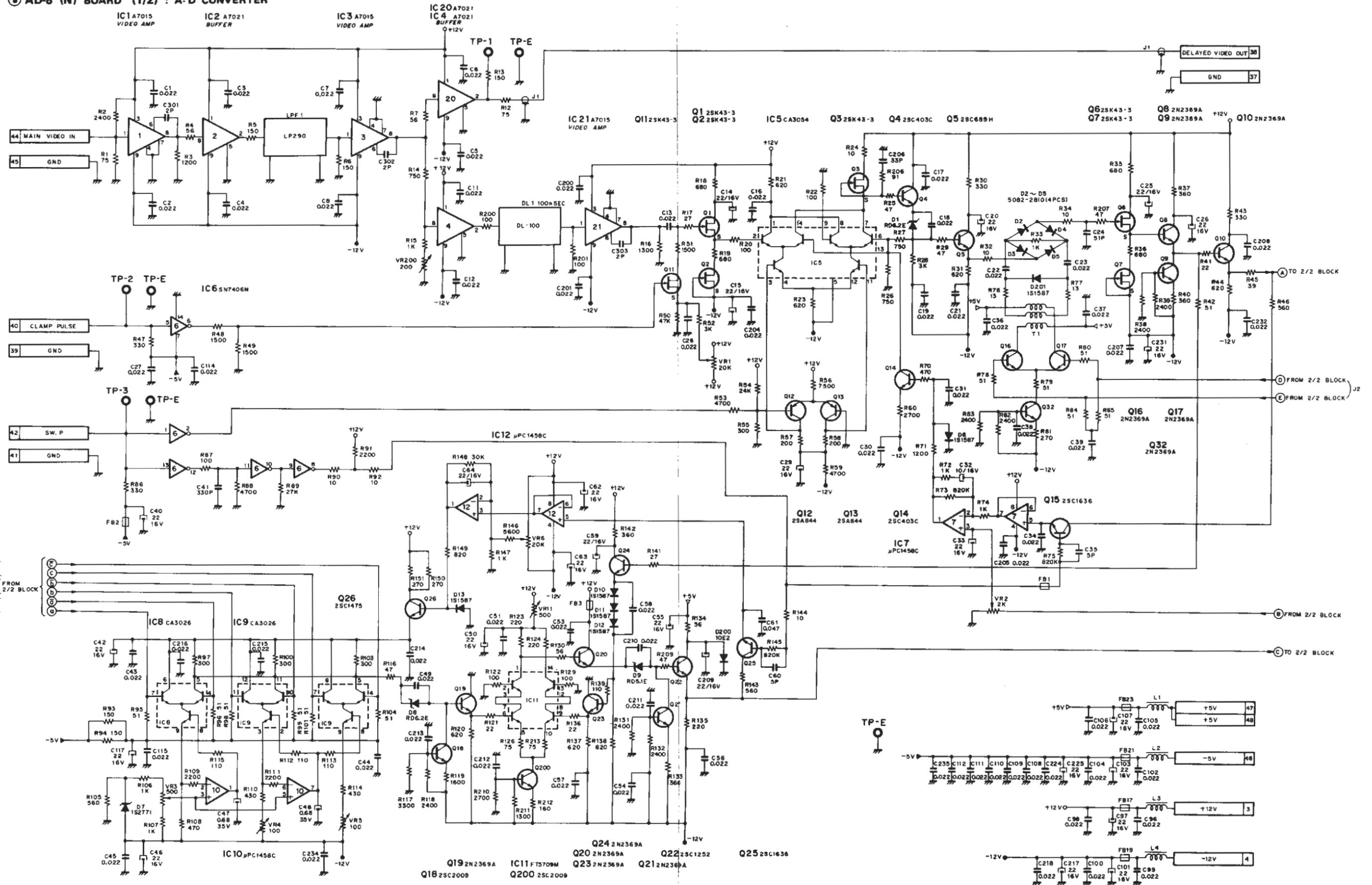


10 CK-3 (N) BOARD : SUB CLOCK
 FAST BIDIREX CLOCK GENERATOR
 GATED H GENERATOR
 SELECTED H/READ H MODULATOR
 NORMAL PLAYBACK DETECTOR
 FAST FWD/REV BIDIREX DETECTOR
 MODE CONTROL SIGNAL GENERATOR

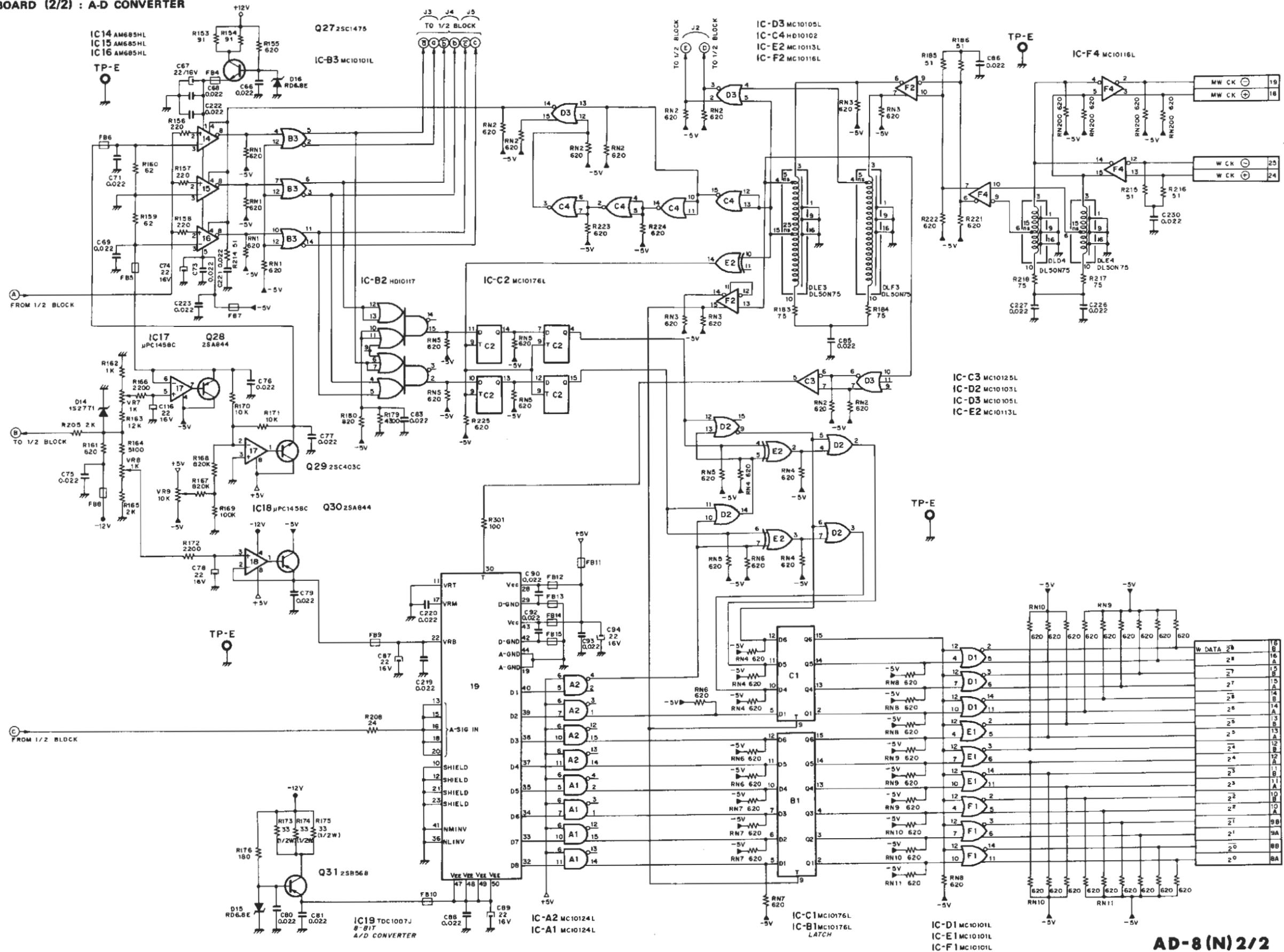


CK-3 (N)

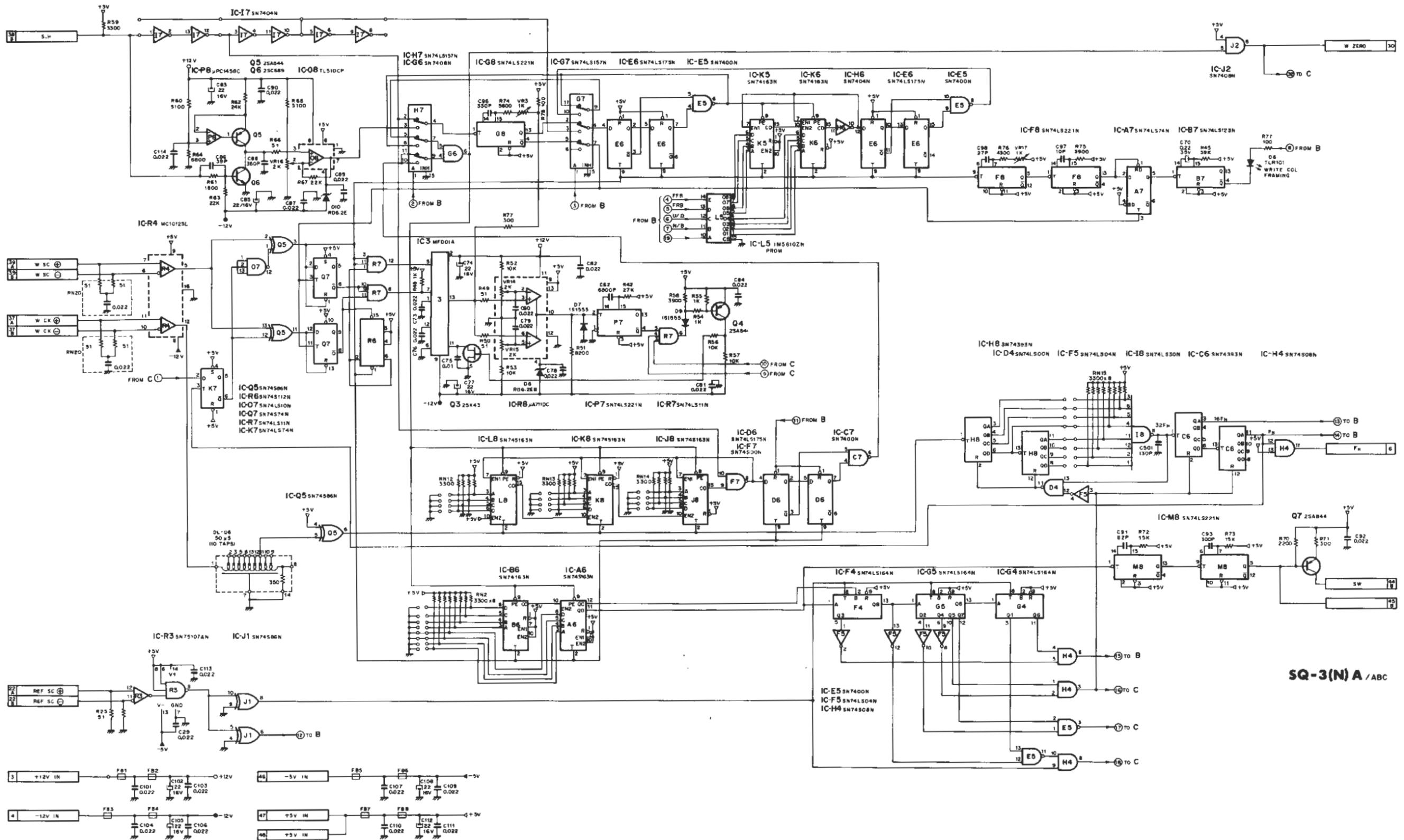
⑨ AD-8 (N) BOARD (1/2) : A-D CONVERTER



⑨ AD-8 (N) BOARD (2/2) : A-D CONVERTER

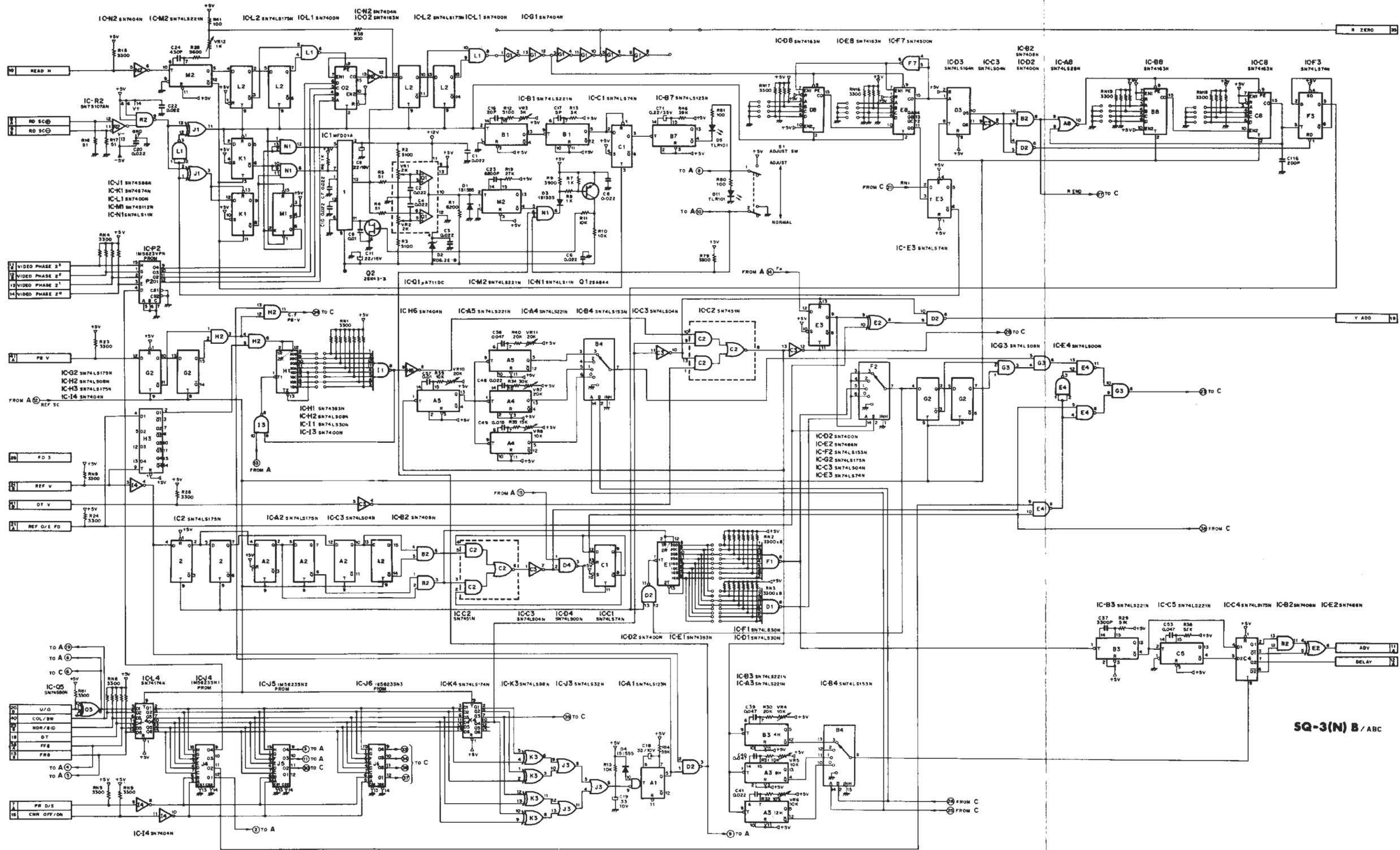


⑦ SQ-3 (N) BOARD (A/ABC) : SEQUENCER
WRITE ZERO GENERATOR

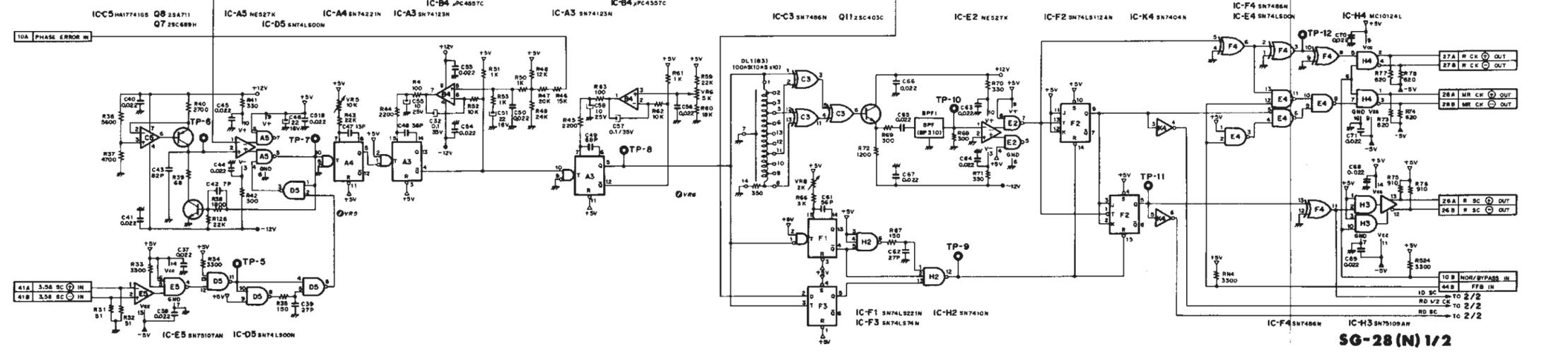
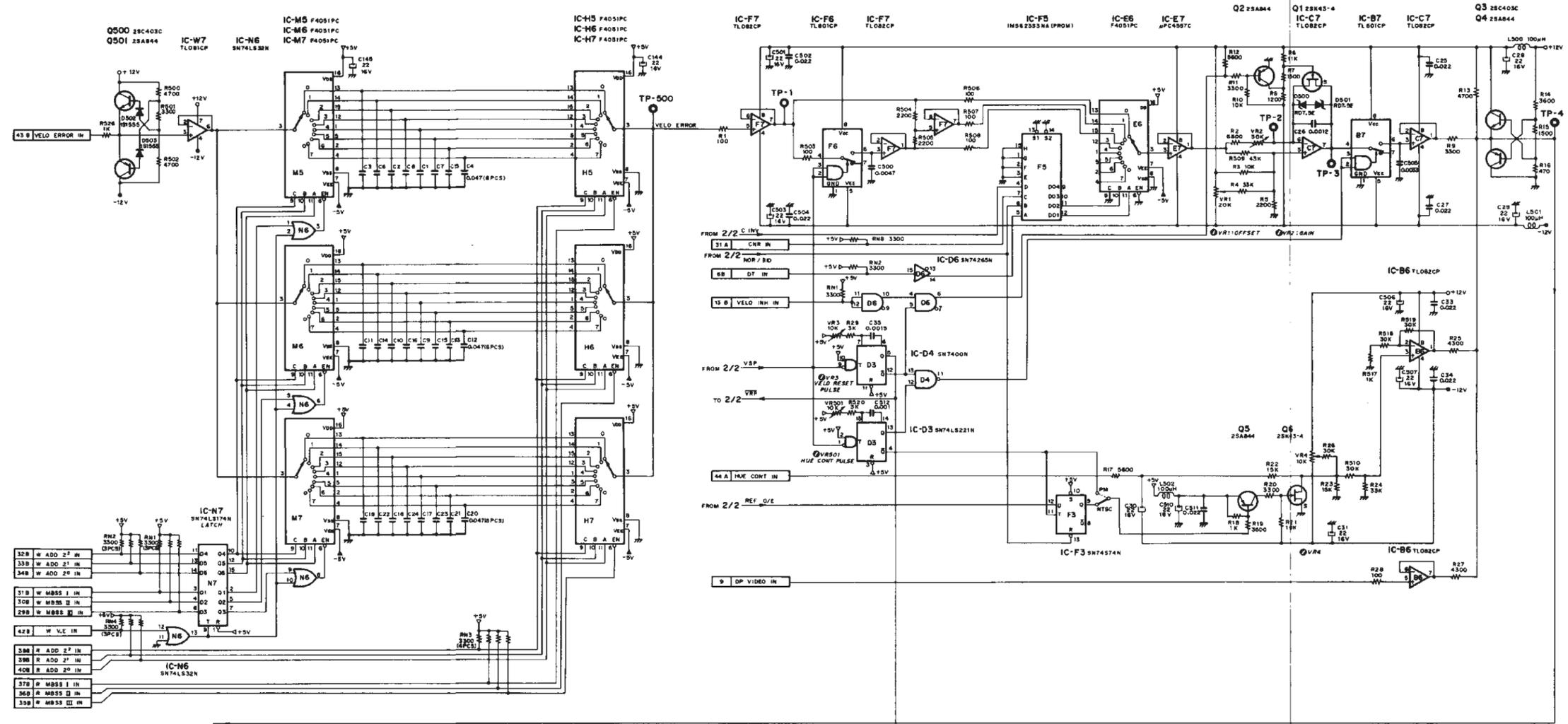


SQ-3(N) A / ABC

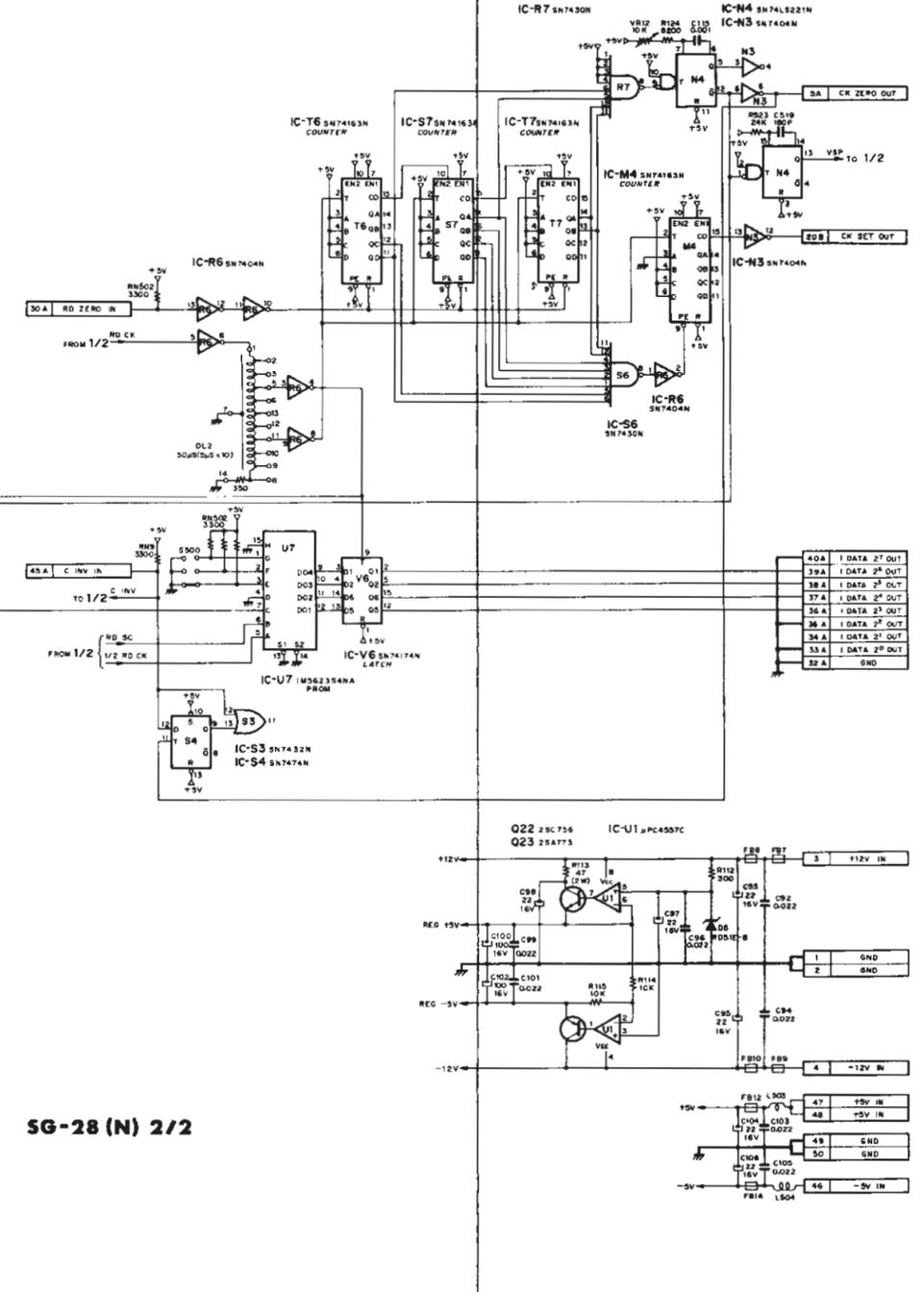
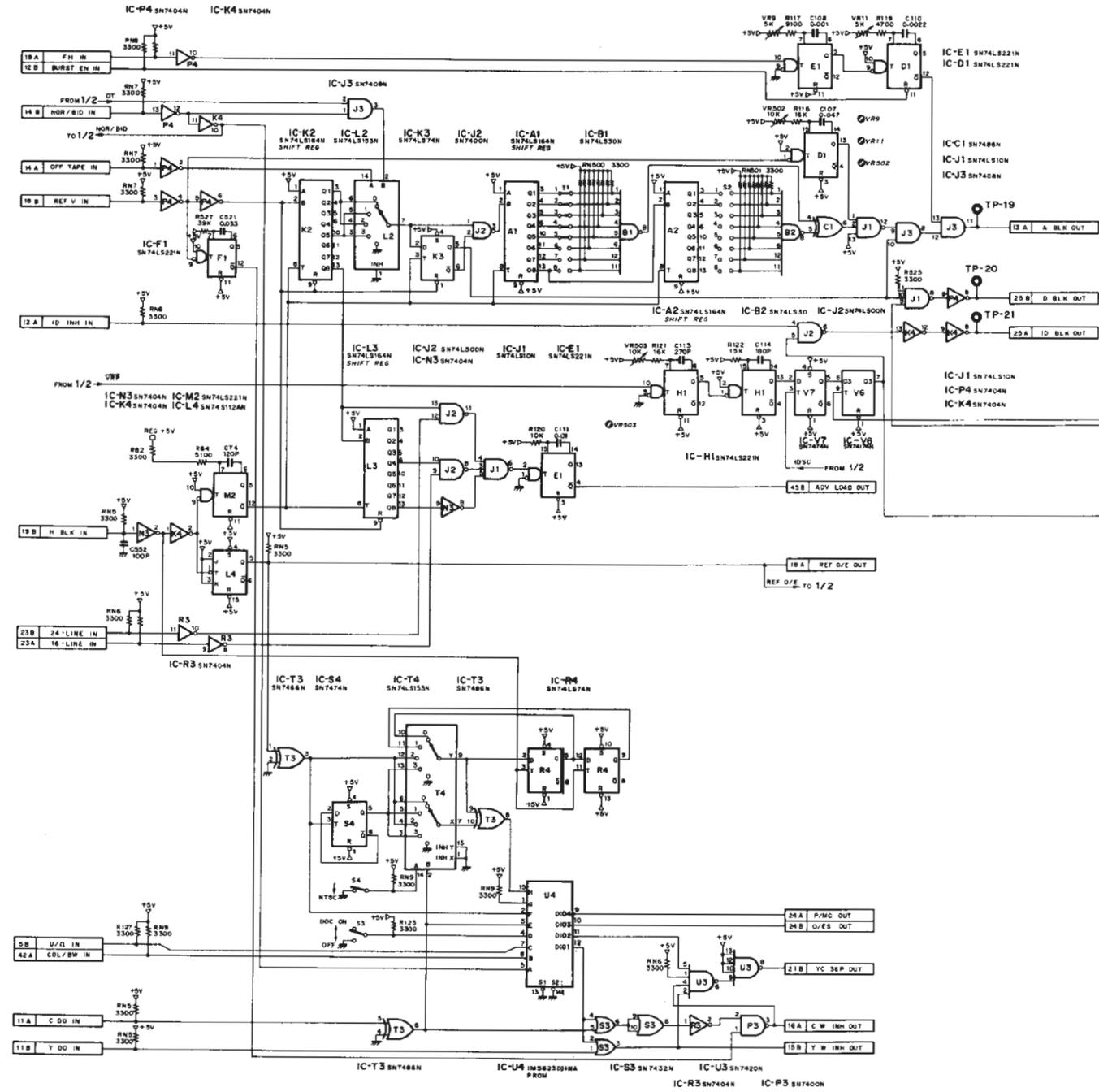
⑦ SQ-3 (N) BOARD (B/ABC) : SEQUENCER
READ ZERO GENERATOR



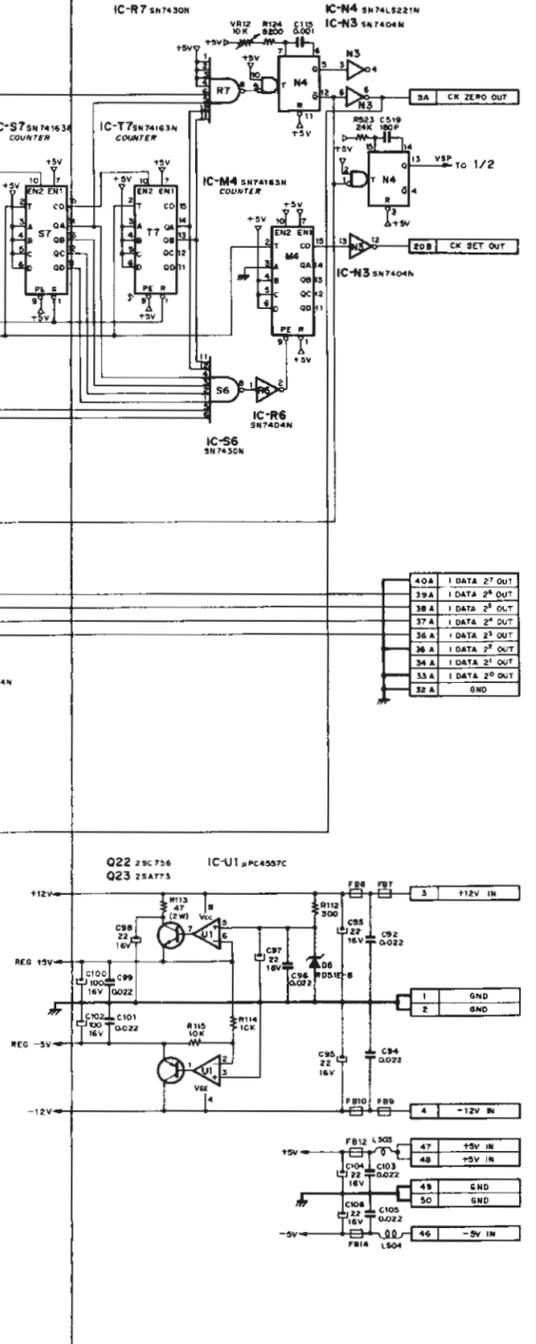
⑧ SG-28 (N) BOARD (1/2) : SYNC GENERATOR
 READ CLOCK GENERATOR
 READ SC GENERATOR



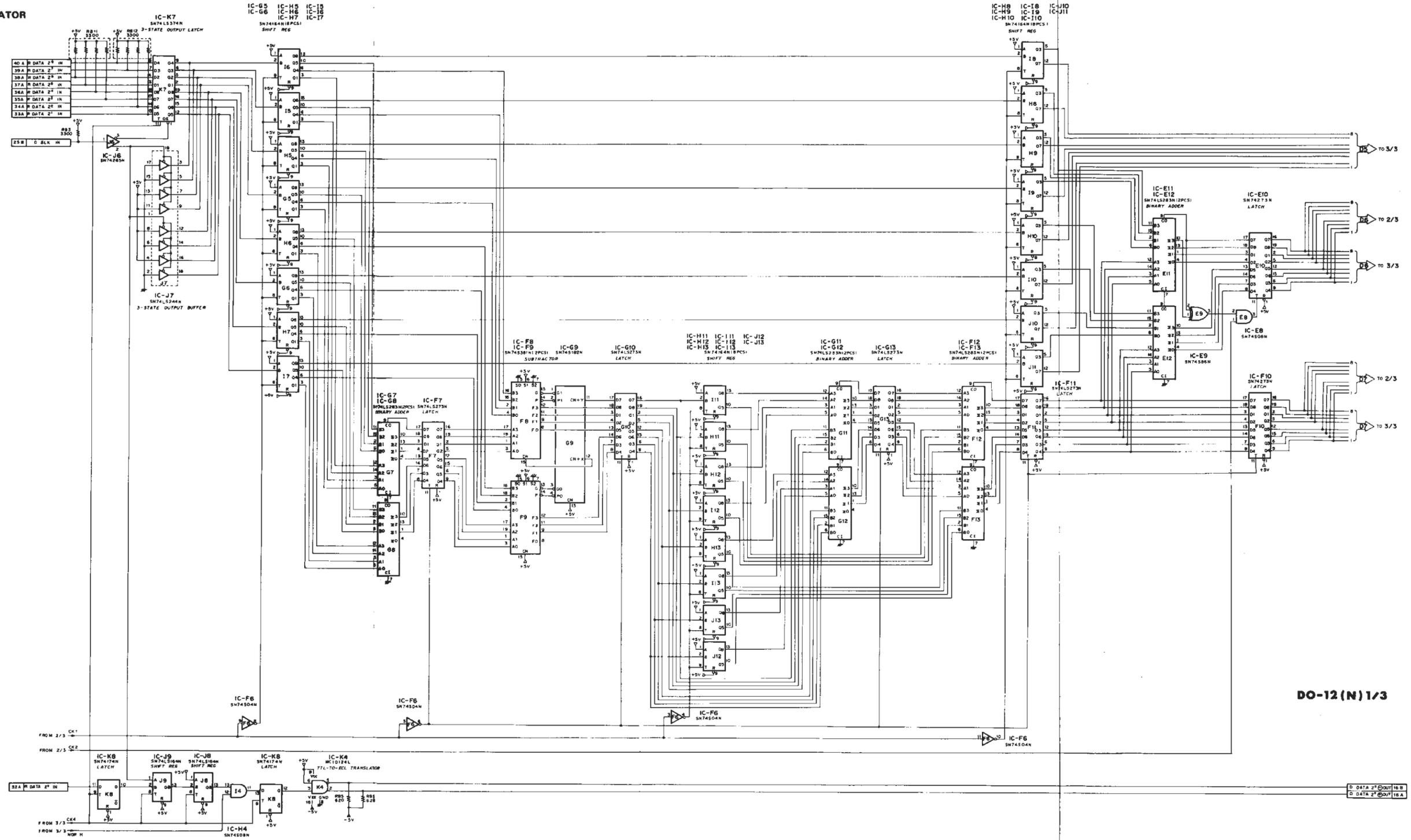
⑥ SG-28 (N) BOARD (2/2) : SYNC GENERATOR 2
BLANKING SIGNAL GENERATOR
DOC CONTROL



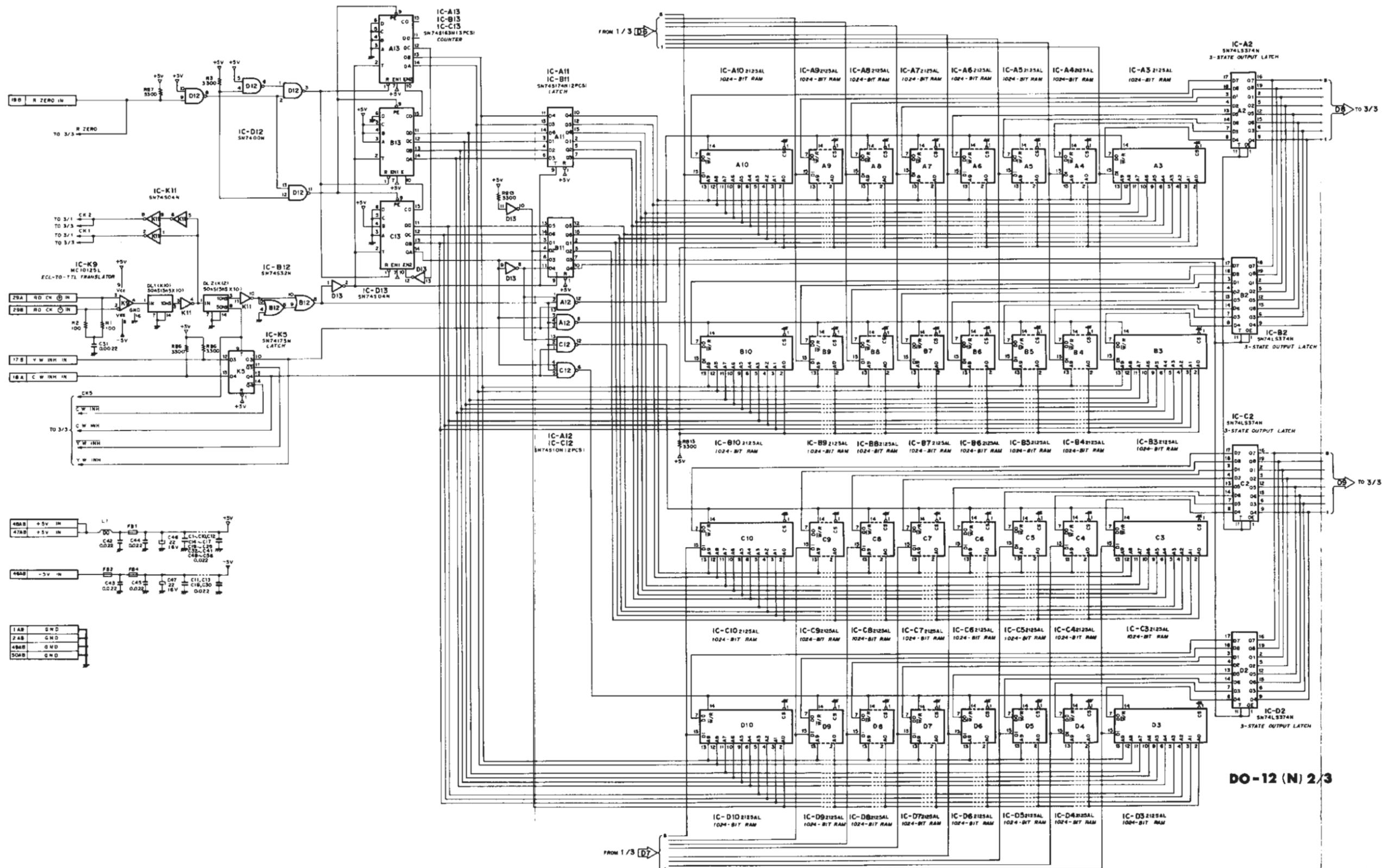
SG-28 (N) 2/2



⑥ DO-12 (N) BOARD (1/3) : DROPOUT COMPENSATOR
Y/C SEPARATOR

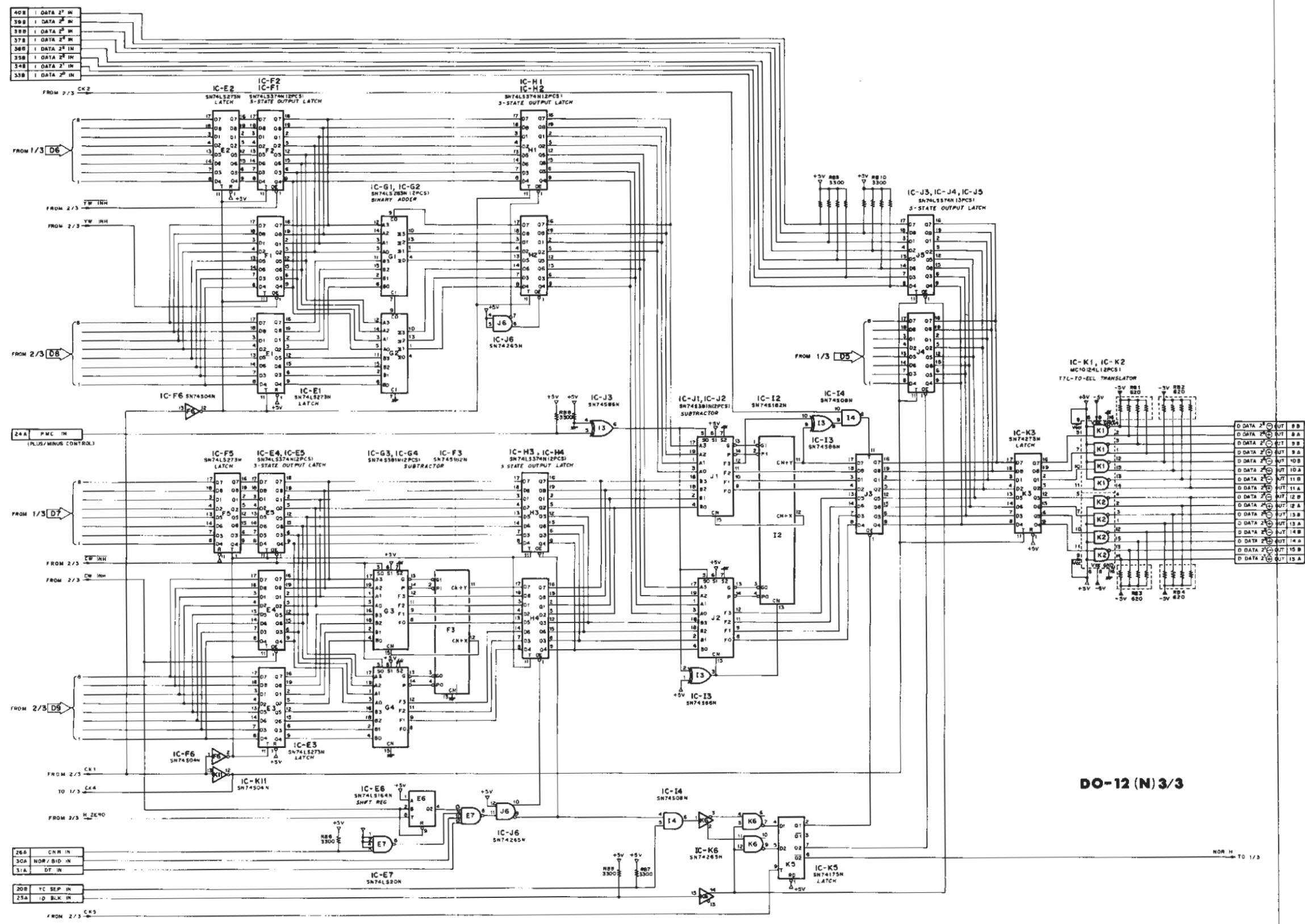


DO-12 (N) BOARD (2/3) : DROPOUT COMPENSATOR
 Y/C DOC MEMORY



DO-12 (N) 2/3

(N) BOARD (3/3) : DROPOUT COMPENSATOR
 DOC PROCESSOR

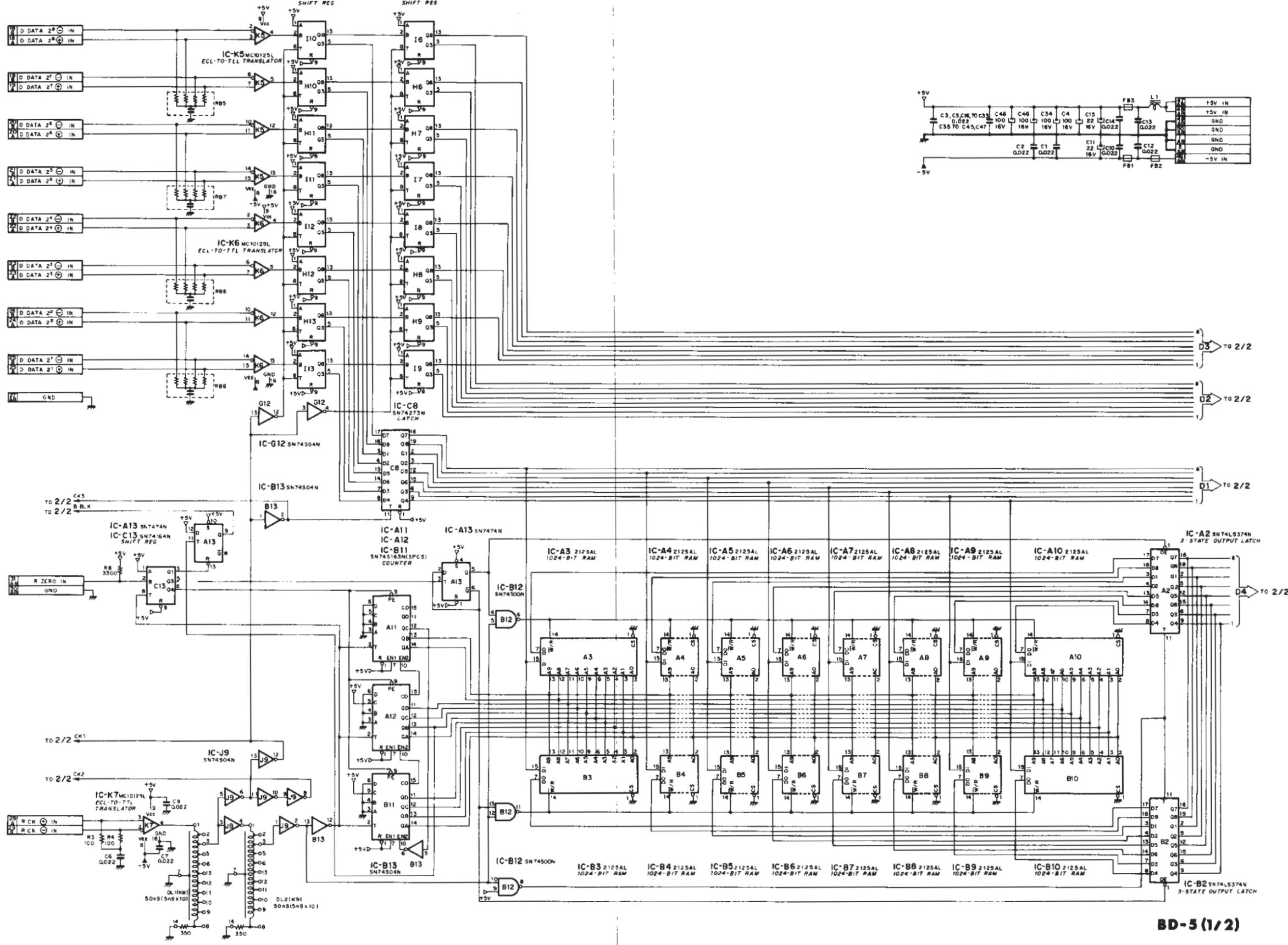


④ BD-5 (N) BOARD (1/2) : BIDIREX
1H DELAY MEMORY

IC-I10	IC-H10	IC-16	IC-H6
IC-I11	IC-H11	IC-17	IC-H7
IC-I12	IC-H12	IC-18	IC-H8
IC-I13	IC-H13	IC-19	IC-H9

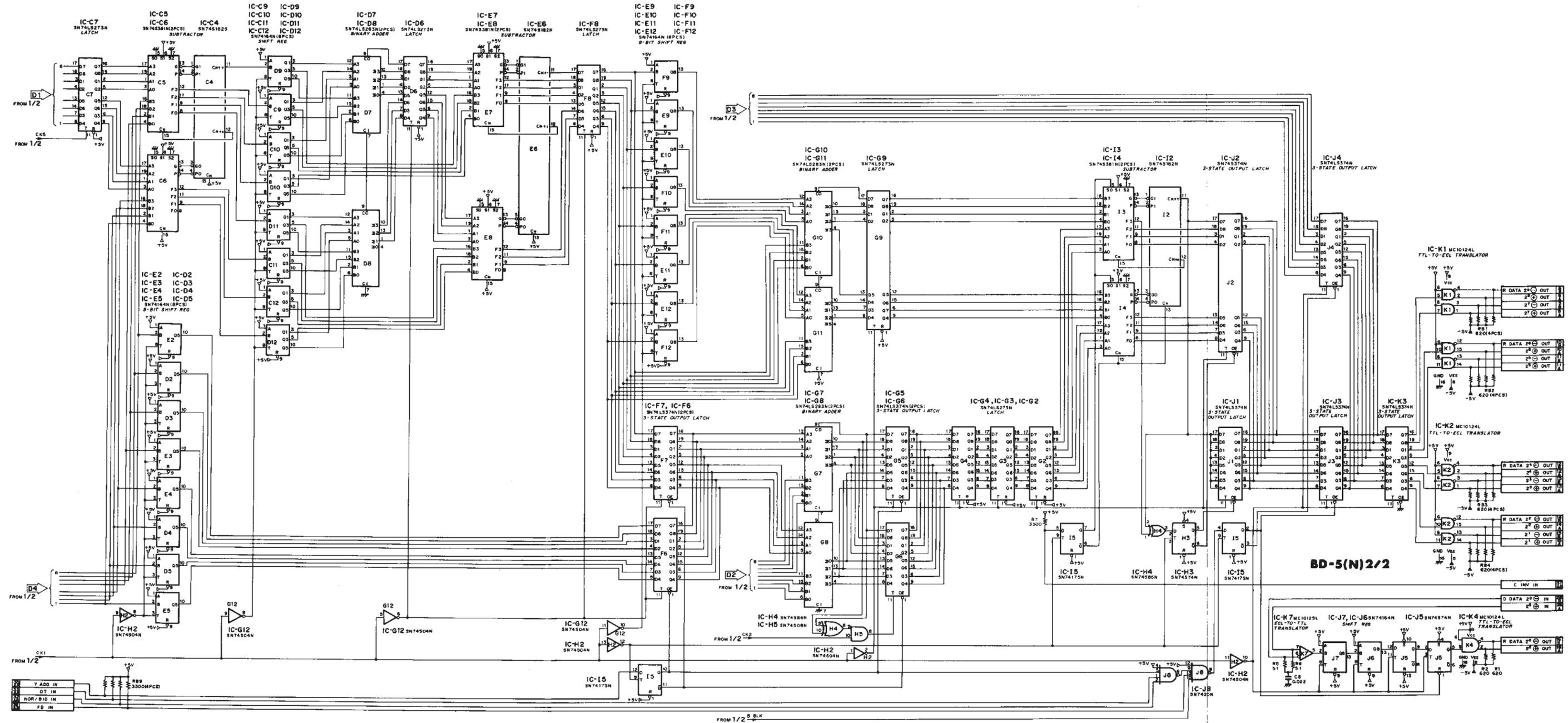
SN74164N(8PCS)
SHIFT REG

SN74164N(8PCS)
SHIFT REG

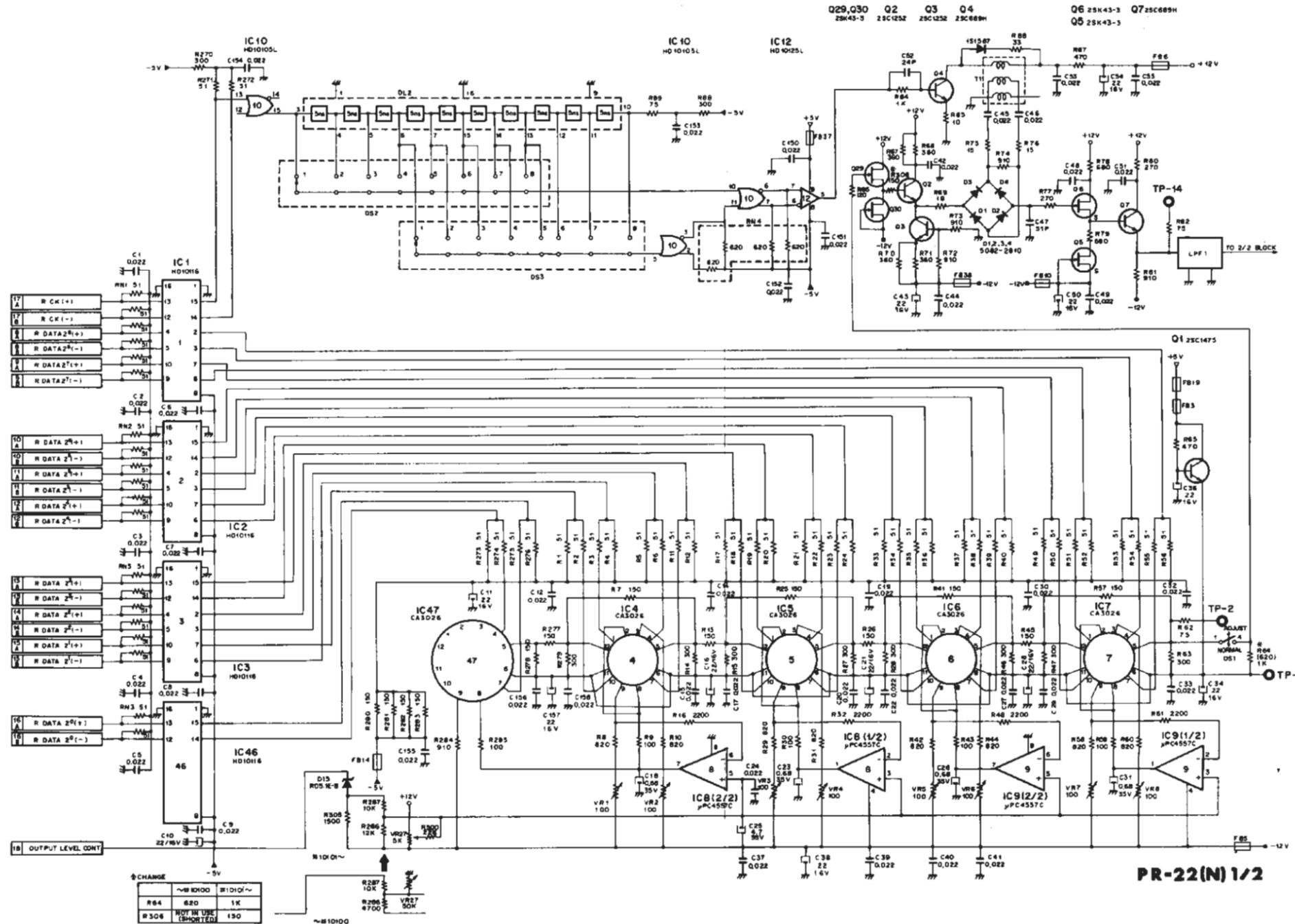


BD-5 (1/2)

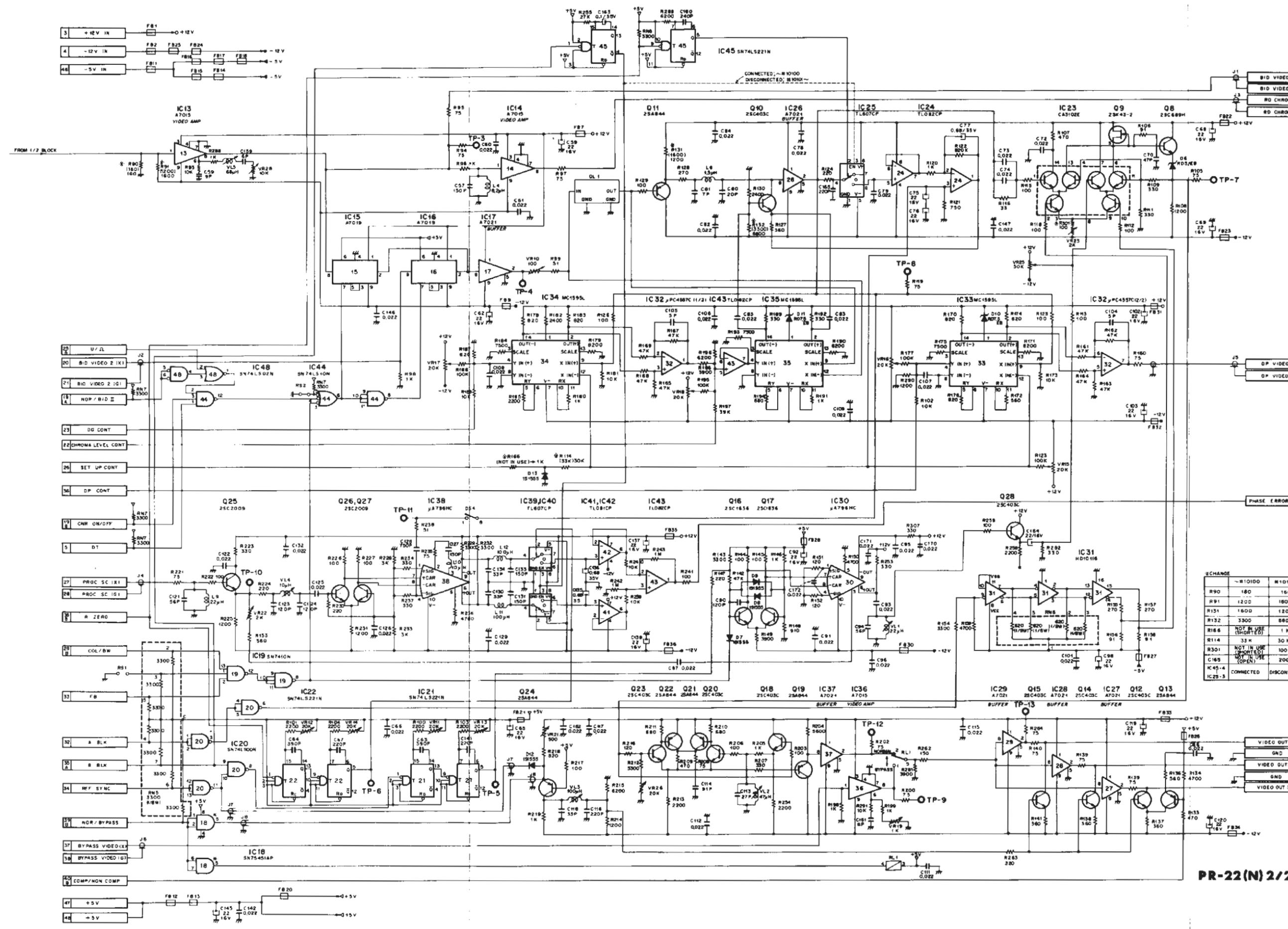
④ BD-5 (N) BOARD (2/2) : BIDIREX
 CHROMA FILTER
 Y LINE ADDER
 Y/C MIXER



③ PR-22 (N) BOARD (1/2) : PROCESSOR
D-A CONVERTER

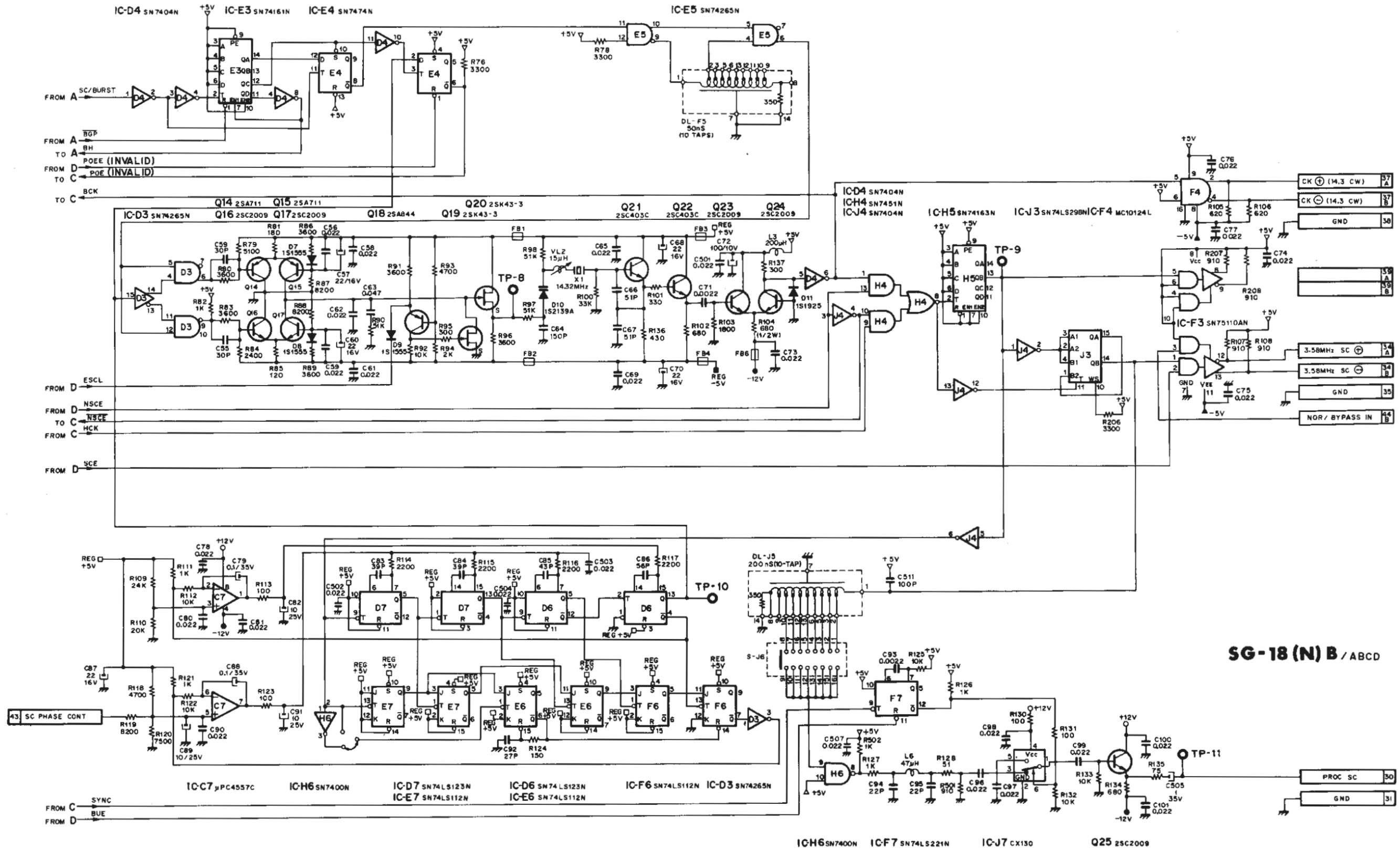


**PR-22 (N) BOARD (2/2) : PROCESSOR
VIDEO PROCESSING AMPLIFIER**

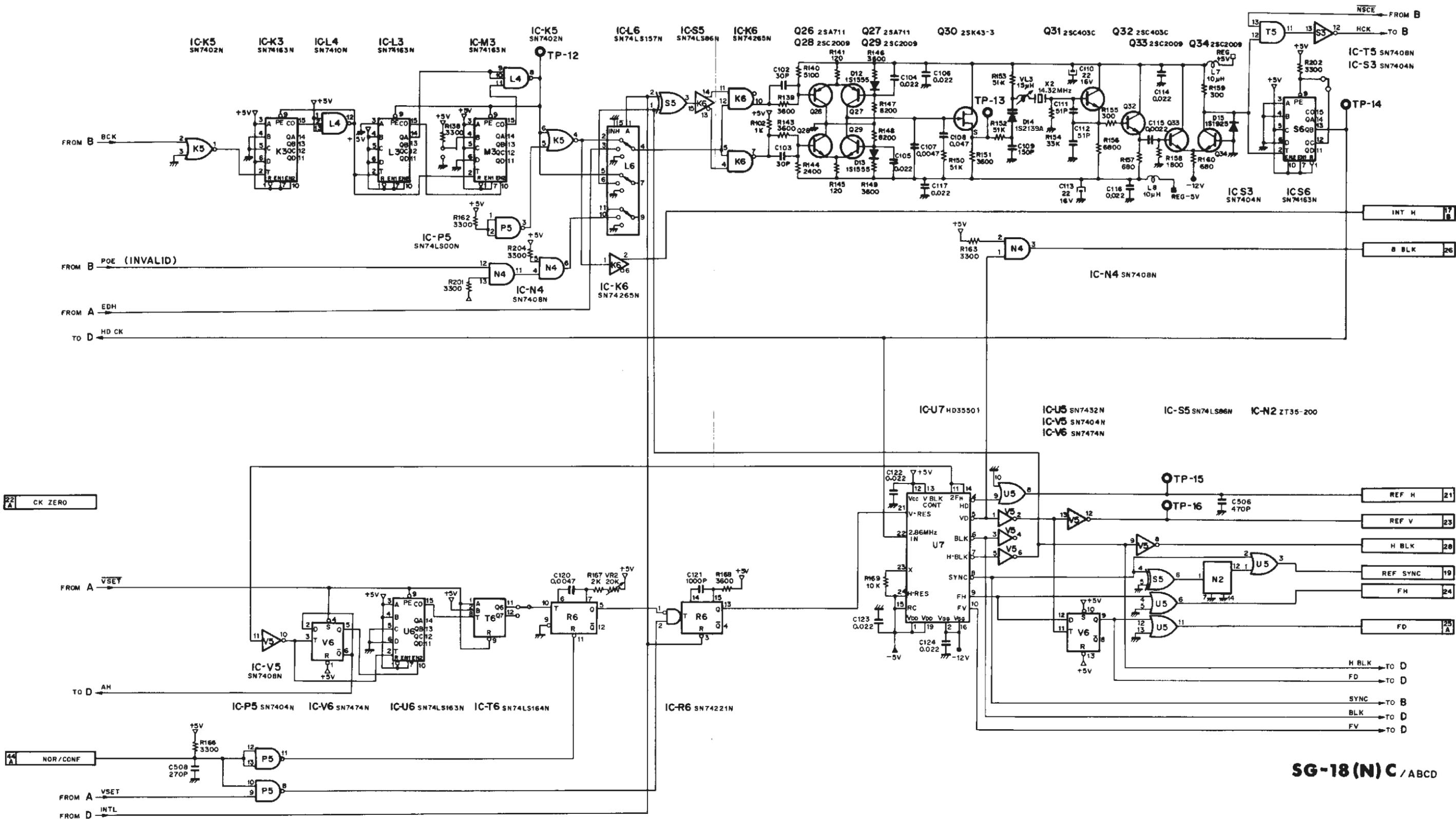


EXCHANGE	~R10100	R1010
R90	180	150
R91	1200	1800
R131	1800	1200
R132	3300	8800
R166	NOT IN USE	1 K
R114	33 K	30 K
R301	NOT IN USE	100
C165	NOT IN USE	200P
IC45-4	CONNECTED	DISCONNECTED
IC25-5	CONNECTED	DISCONNECTED

② SG-18 (N) BOARD (B/ABCD) : SYNC GENERATOR 1

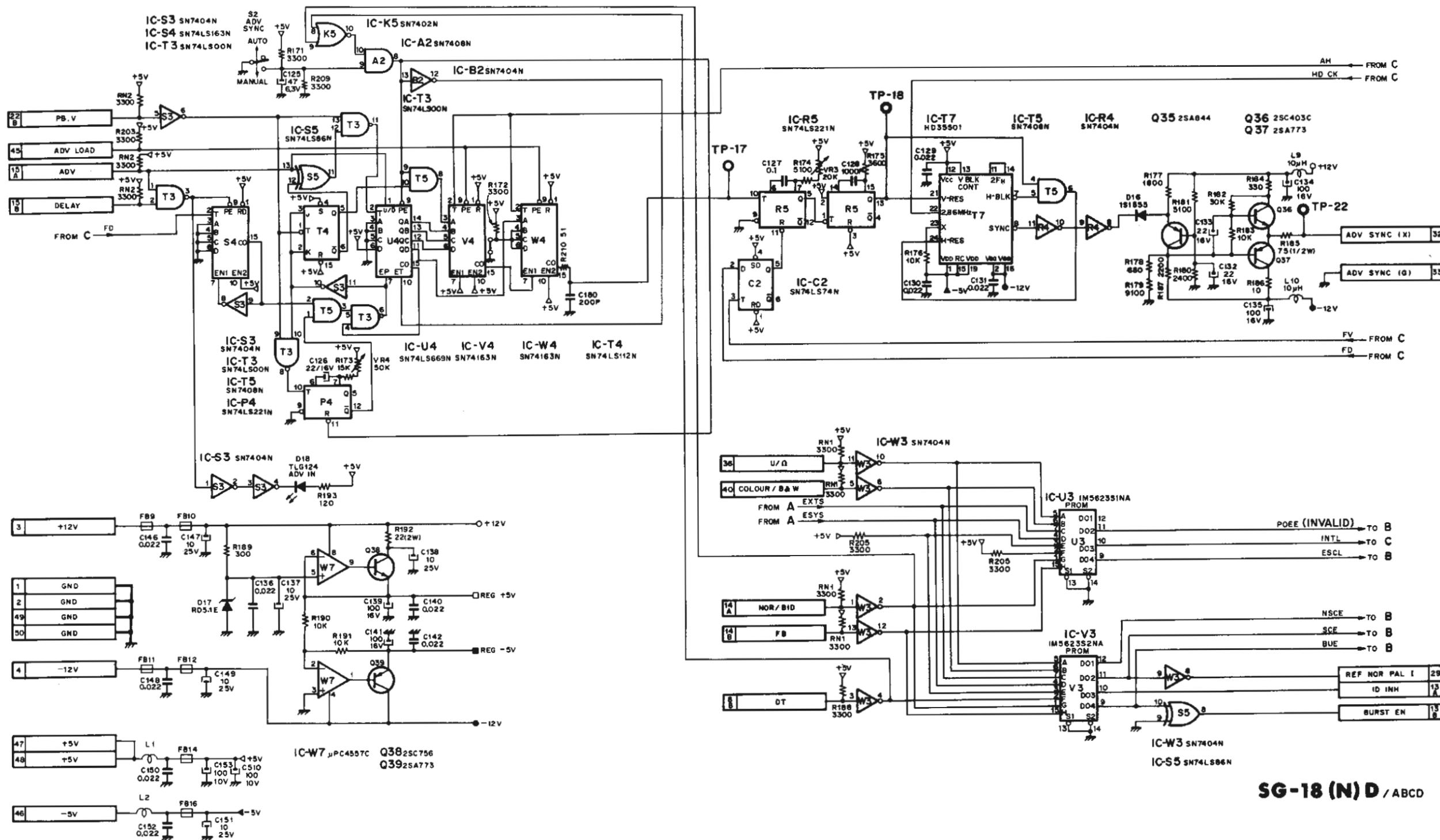


② SG-18 (N) BOARD (C/ABCD) : SYNC GENERATOR 1

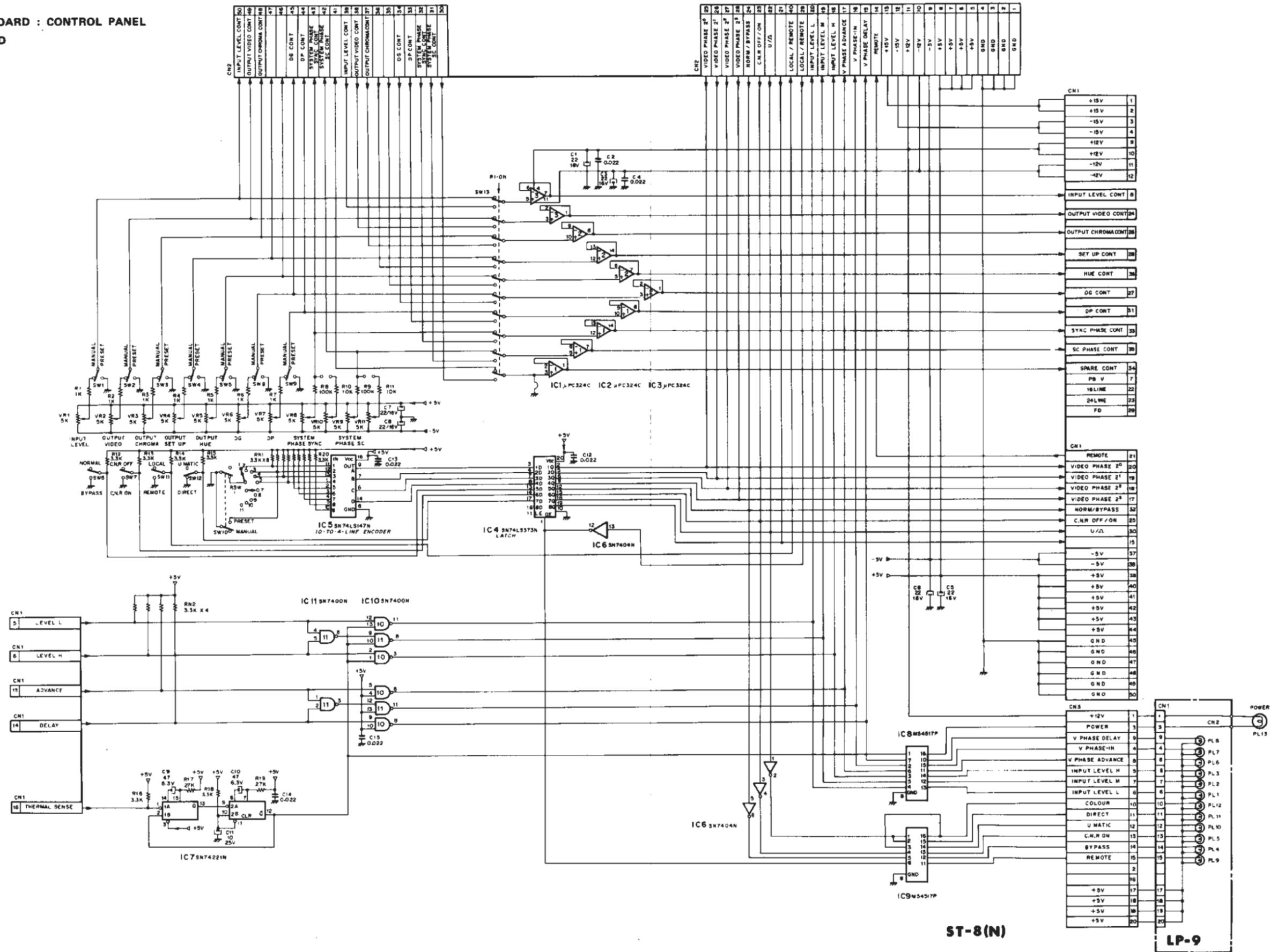


SG-18 (N) C / ABCD

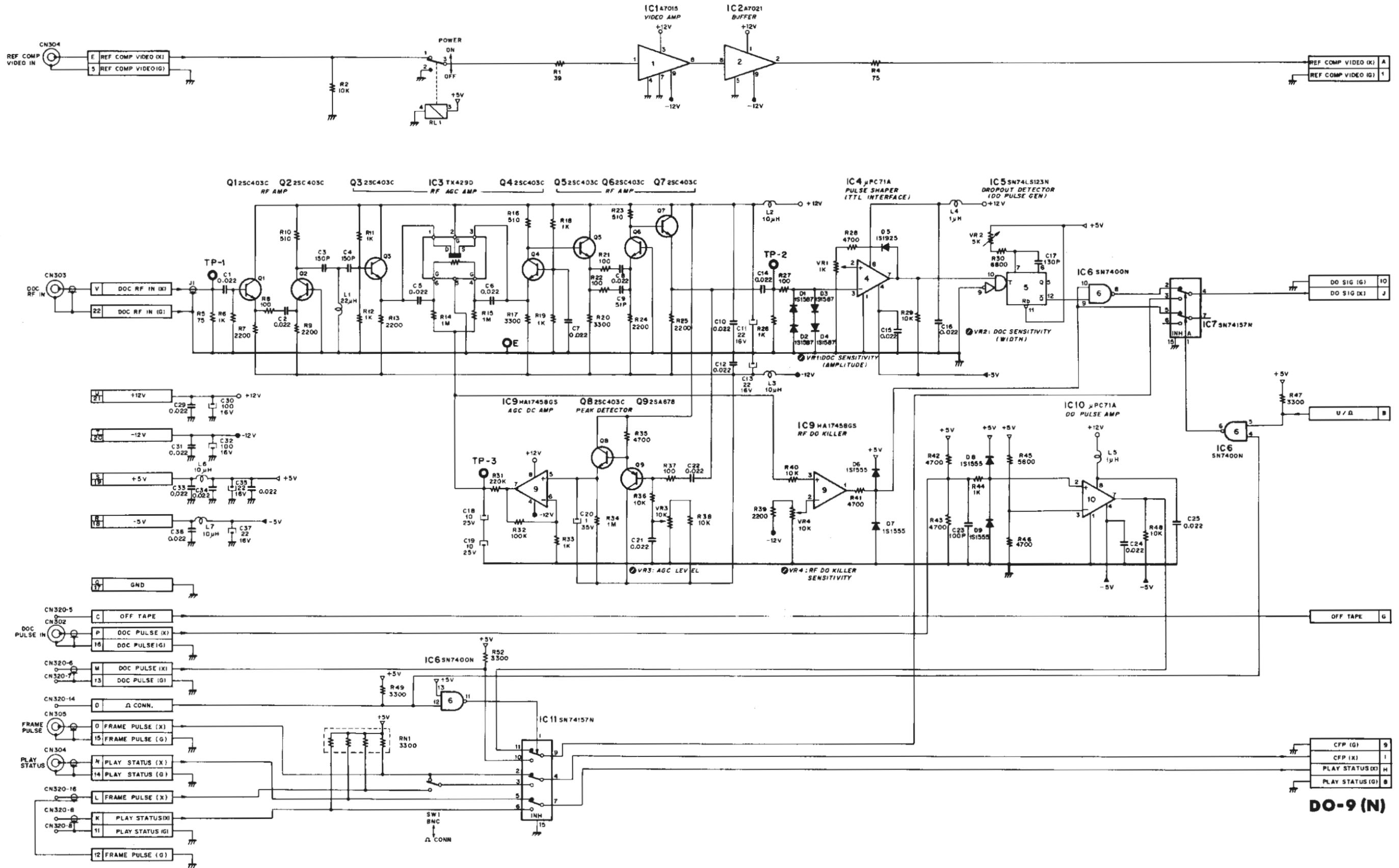
② SG-18 (N) BOARD (D/ABCD): SYNC GENERATOR 1



ST-8 (N) BOARD : CONTROL PANEL
LP-9 BOARD

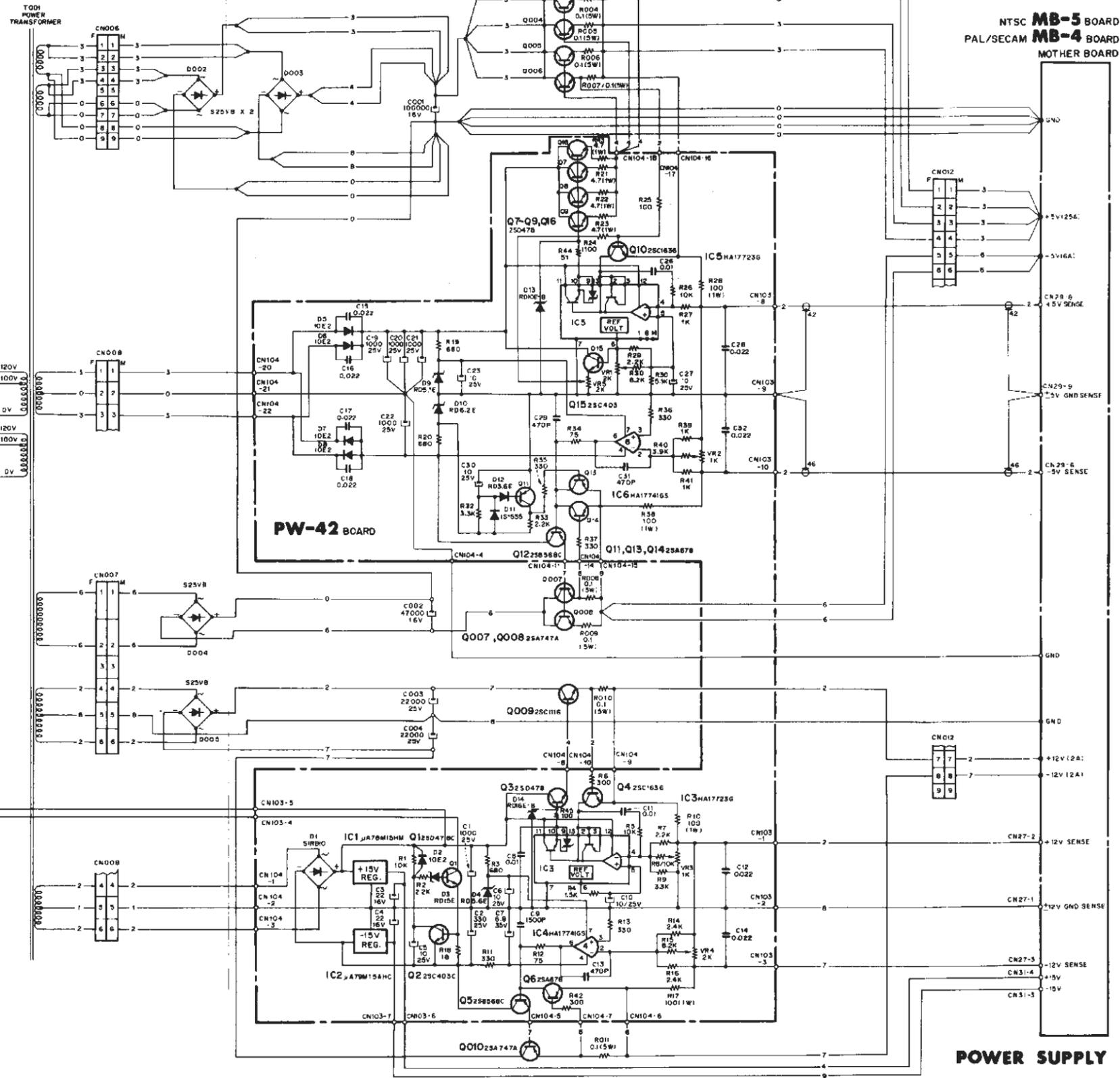
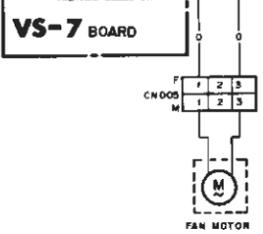
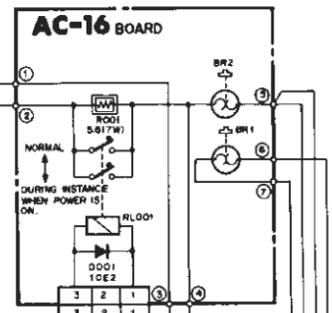
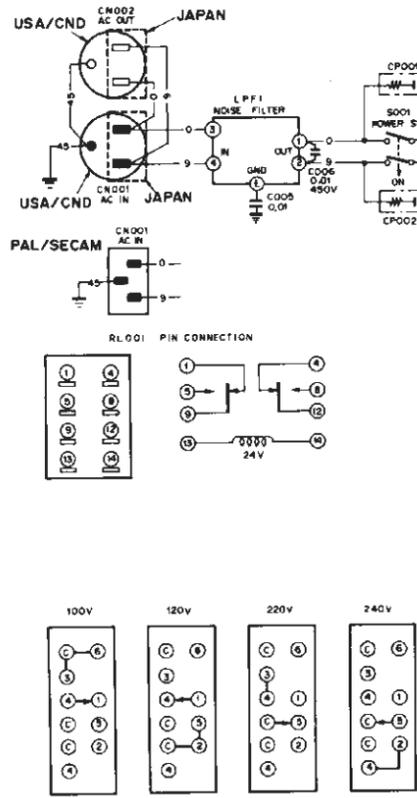


DO-9 (N) BOARD : DROPOUT DETECTOR



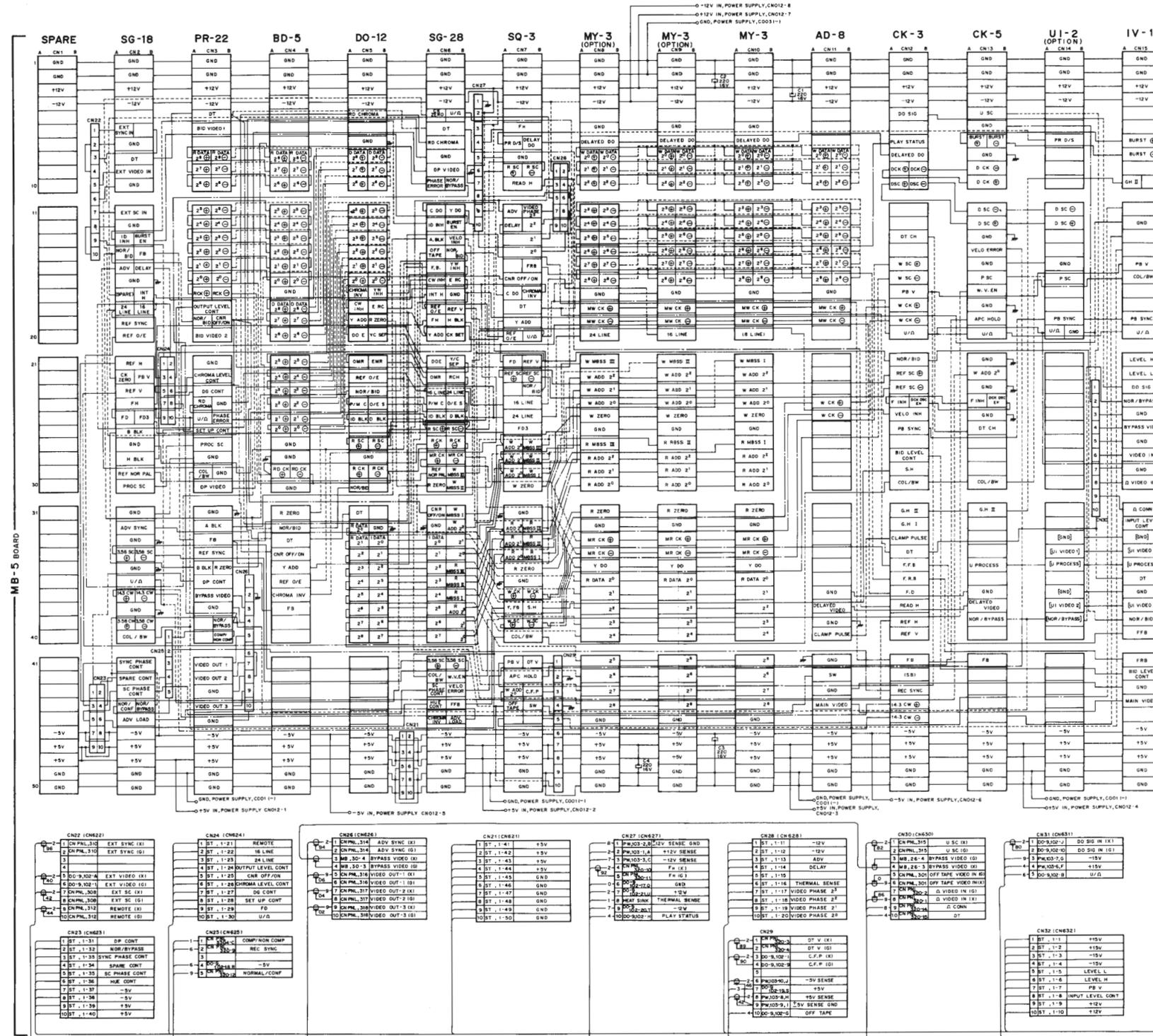
DO-9 (N)

**PW-42 (N) BOARD : POWER SUPPLY
AC-16 BOARD
VS-7 BOARD**

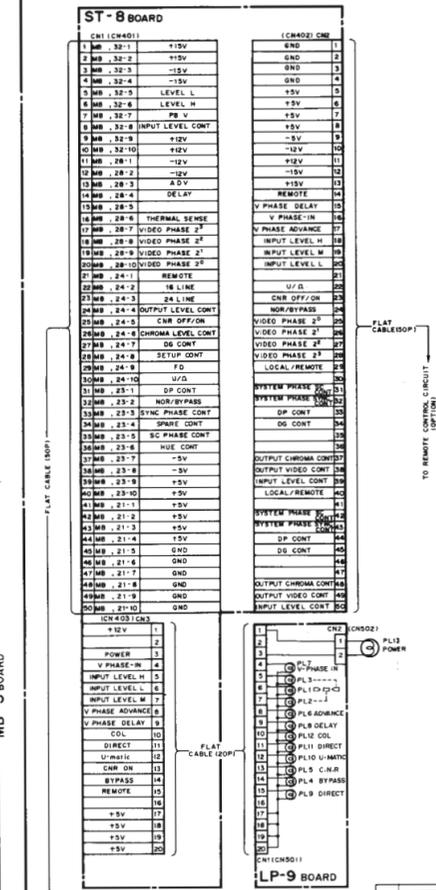


POWER SUPPLY

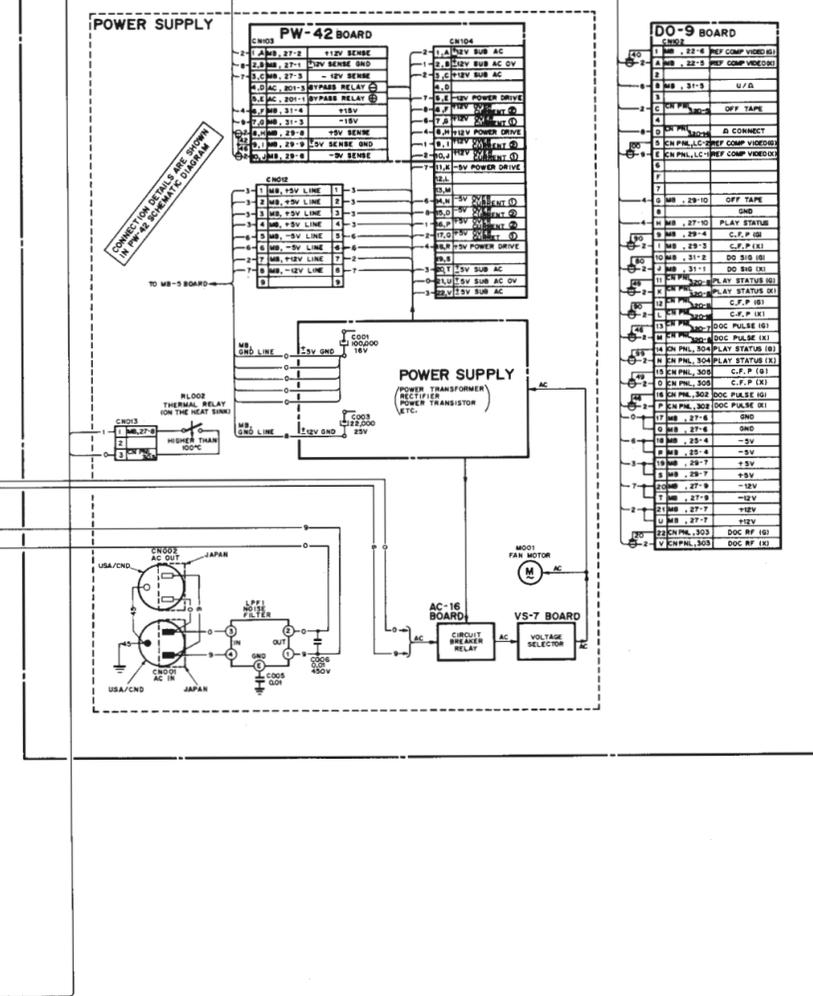
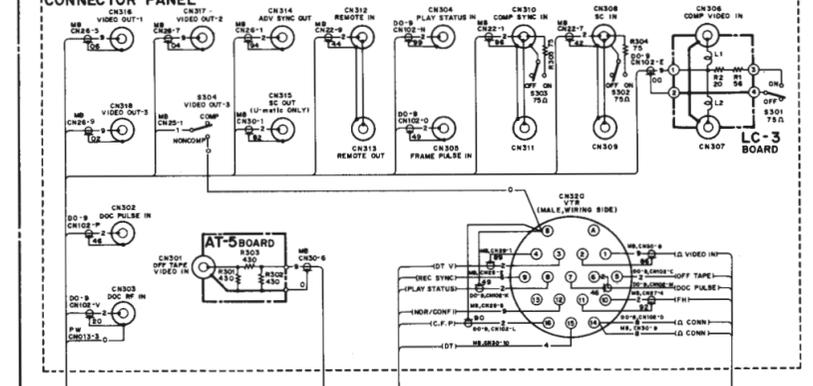
FRAME WIRING
MB-5 BOARD
AT-5 BOARD
LC-3 BOARD



FRONT PANEL

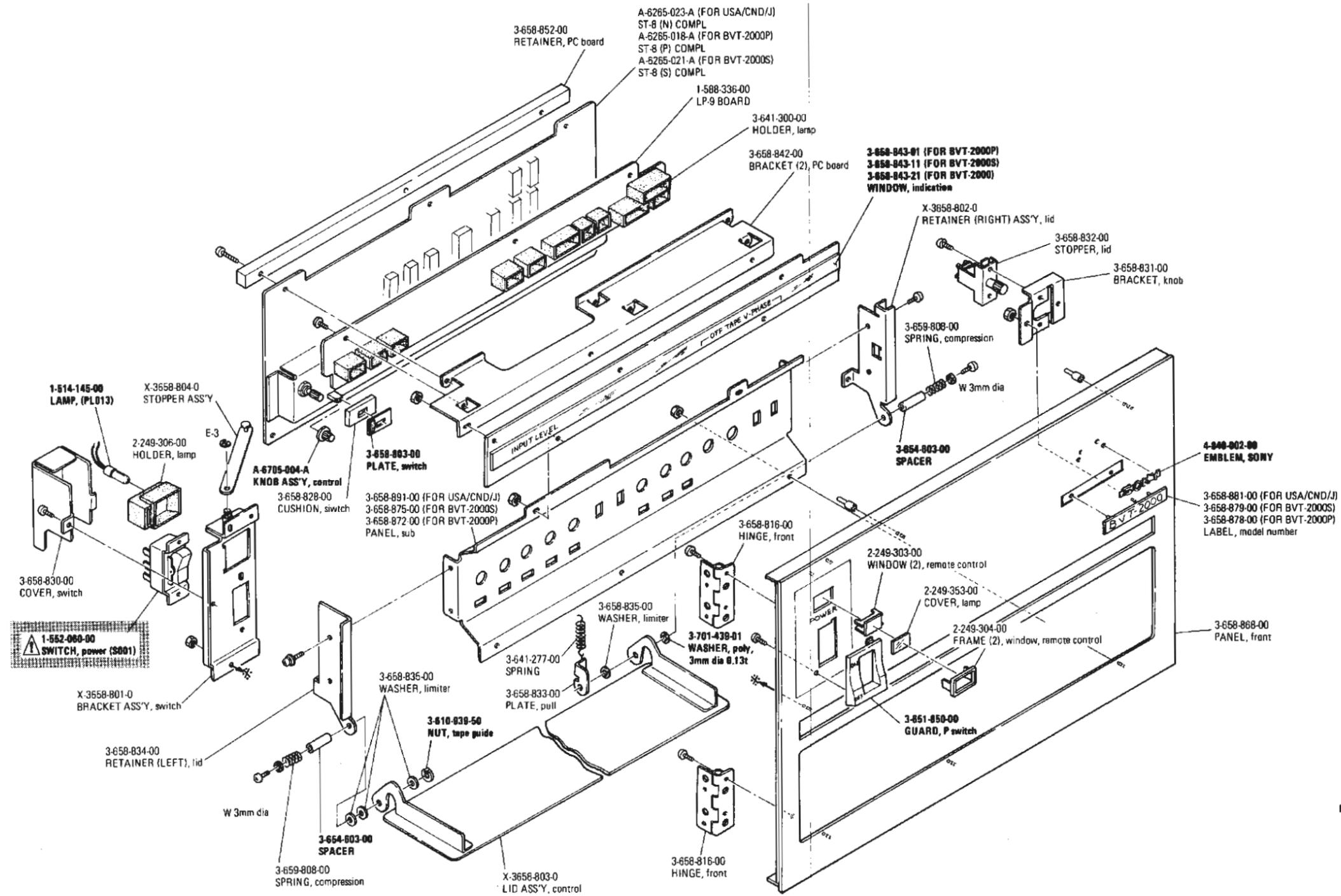


REAR PANEL



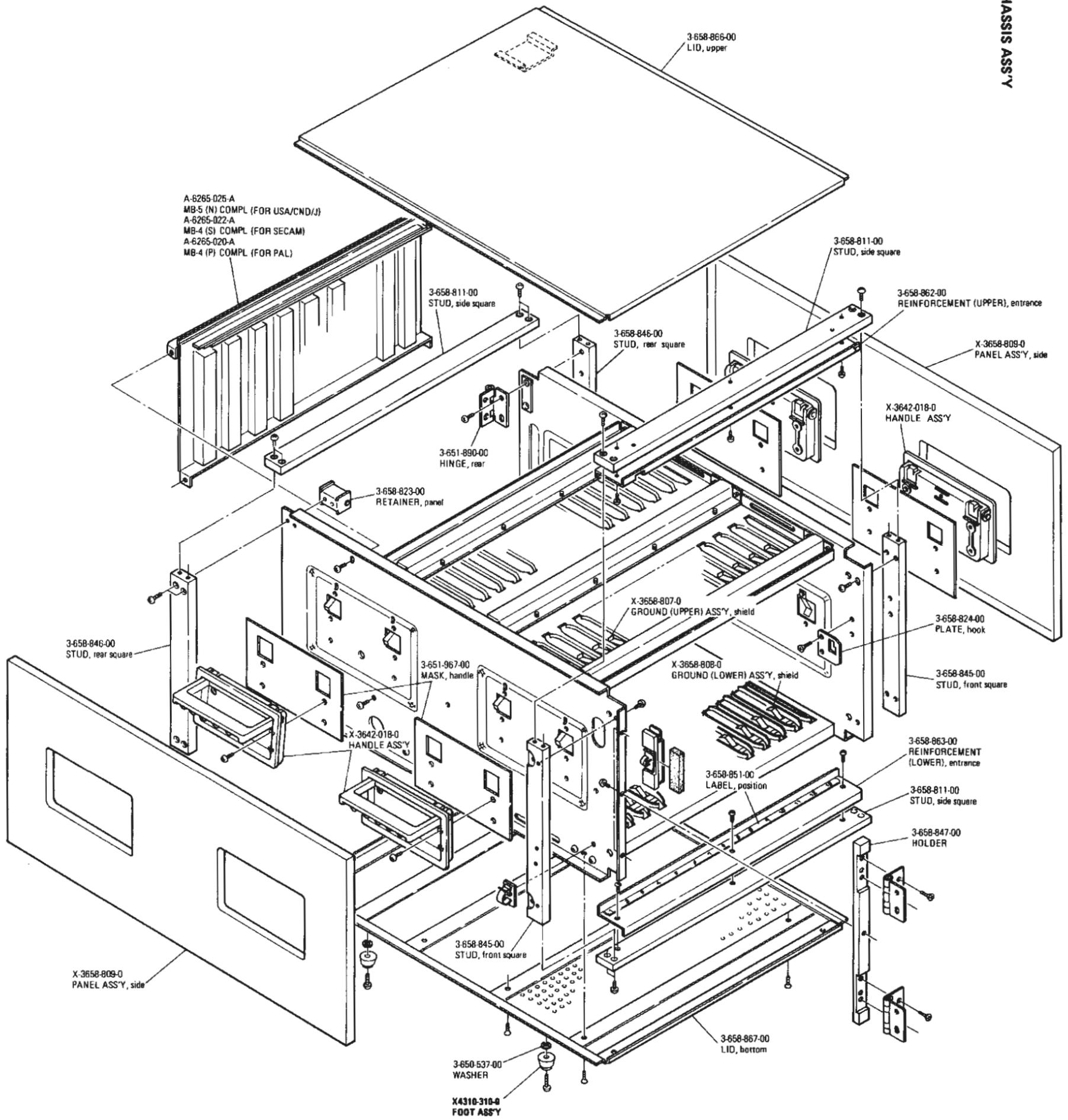
SPARE PARTS

CONTROL PANEL ASS'Y



NOTE:

1. Since this exploded view includes the information of the four models, BVT-2000 (USA/CND; NTSC), BVT-2000 (JAPAN; NTSC), BVT-2000P (PAL) and BVT-2000S (SECAM), pay attention to the notices such as "FOR USA/CND".
2. **The shaded and Δ -marked components are critical to safety. Replace only with same component as specified.**
3. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.



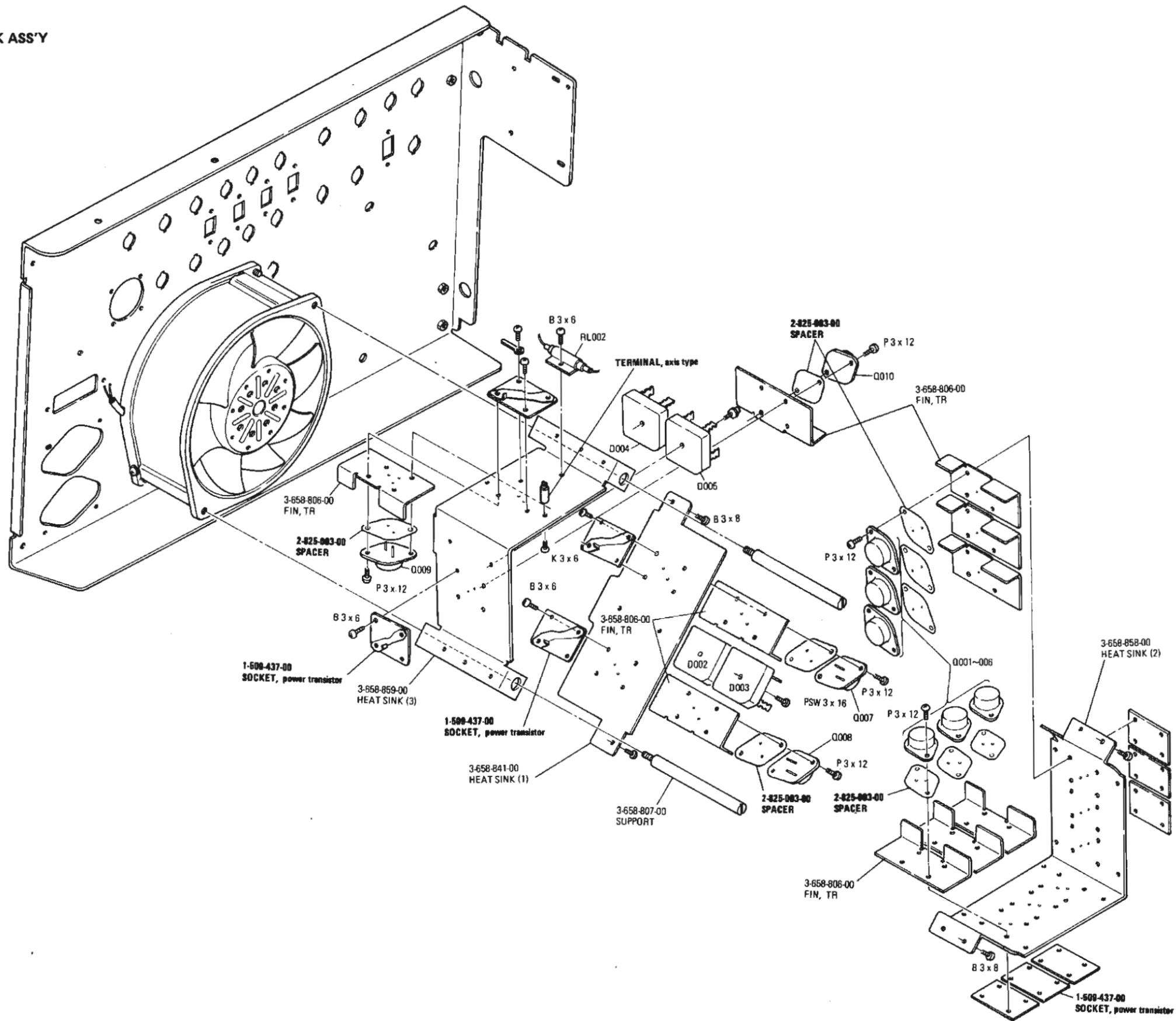
3

4

NTSC	PAL	SECAM	NTSC	PAL	SECAM
② A-6259-072-A SG-18 (N) COMPL	A-6257-029-A BD-2 (P) COMPL	NONE	⑧ A-6259-068-A MY-3 (N) COMPL	A-6259-054-A MY-3 (P) COMPL	SAME AS LEFT
③ A-6257-036-A PR-22 (N) COMPL	A-6729-058-A SG-18 (P) COMPL	A-6259-064-A SG-18 (S) COMPL	⑨ A-6257-035-A AD-8 (N) COMPL	A-6257-027-A AD-5 (P) COMPL	A-6257-068-A AD-5 (S) COMPL
④ A-6259-065-A BD-5 COMPL	A-6257-028-A PR-22 (P) COMPL	A-6257-069-A PR-22 (S) COMPL	⑩ A-6259-067-A CK-3 (N) COMPL	A-6259-053-A CK-3 (P) COMPL	A-6259-060-A CK-3 (S) COMPL
⑤ A-6259-071-A DO-12 (N) COMPL	A-6259-057-A DO-8 (P) COMPL	SAME AS LEFT	⑪ A-6259-066-A CK-5 (N) COMPL	A-6259-052-A CK-2 (P) COMPL	A-6259-059-A CK-2 (S) COMPL
⑥ A-6259-070-A SG-28 (N) COMPL	A-6259-056-A SG-19 (P) COMPL	A-6259-062-A SG-19 (S) COMPL	⑬ A-6257-034-A IV-1 (N) COMPL	A-6257-026-A IV-1 (P) COMPL	A-6257-057-A IV-1 (S) COMPL
⑦ A-6259-069-A SQ-3 (N) COMPL	A-6259-055-A SQ-2 (P) COMPL	A-6259-061-A SQ-2 (S) COMPL	A-8252-031-A EXTENSION COMPL	SAME AS LEFT	SAME AS LEFT

- NOTE:**
- Since this exploded view includes the information of the four models, BVT-2000 (USA/CND; NTSC), BVT-2000 (JAPAN; NTSC), BVT-2000P (PAL) and BVT-2000S (SECAM), pay attention to the notices such as "FOR USA/CND".
 - The shaded and Δ -marked components are critical to safety. Replace only with same component as specified.
 - Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.

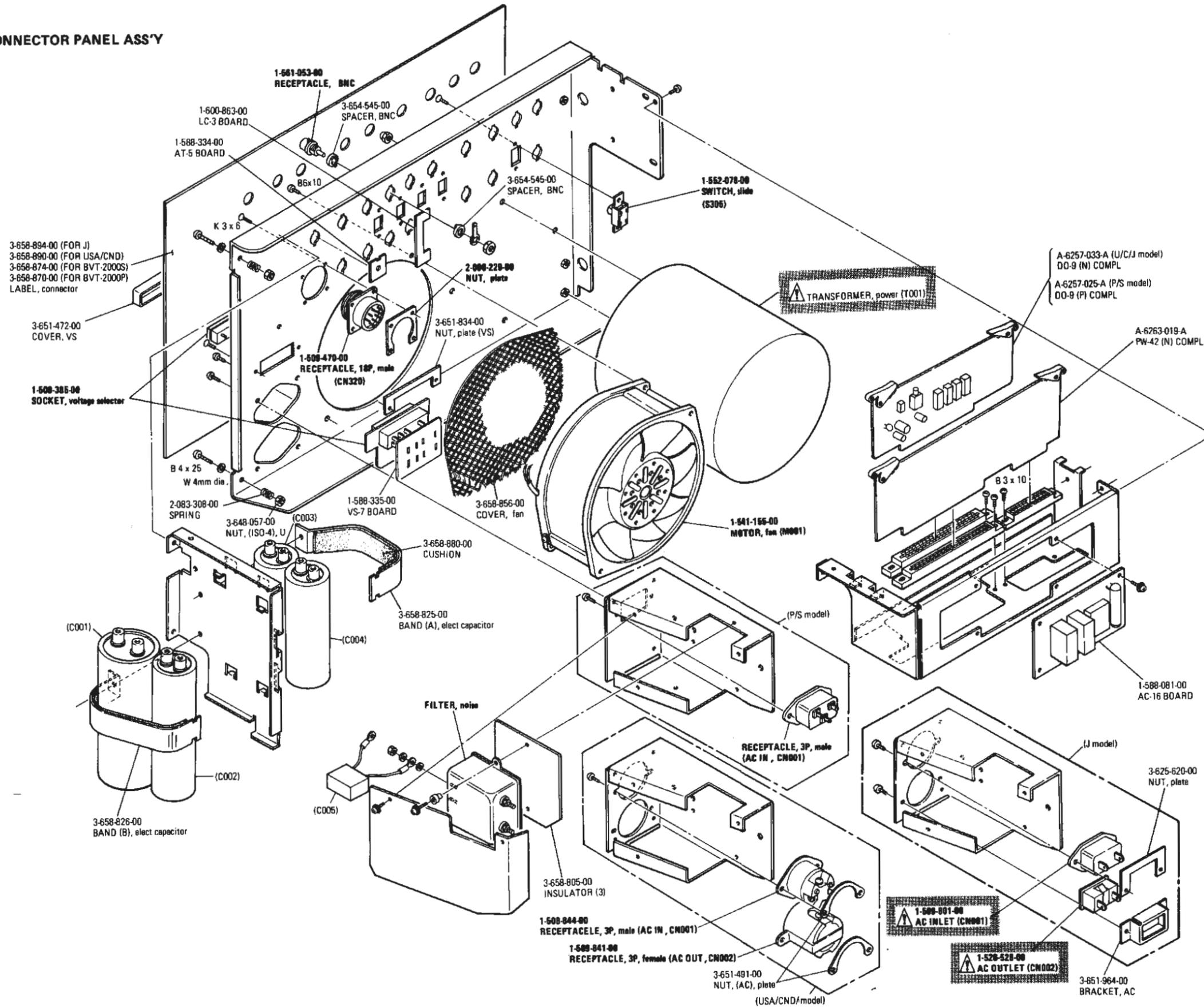
HEAT SINK ASS'Y



NOTE:

1. Since this exploded view includes the information of the four models, BVT-2000 (USA/CND; NTSC), BVT-2000 (JAPAN; NTSC), BVT-2000P (PAL) and BVT-2000S (SECAM), pay attention to the notices such as "FOR USA/CND".
2. The shaded and Δ -marked components are critical to safety. Replace only with same component as specified.
3. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.

CONNECTOR PANEL ASS'Y



NOTE:

1. Since this exploded view includes the information of the four models, BVT-2000 (USA/CND; NTSC), BVT-2000 (JAPAN; NTSC), BVT-2000P (PAL) and BVT-2000S (SECAM), pay attention to the notices such as "FOR USA/CND".
2. The shaded and -marked components are critical to safety. Replace only with same component as specified.
3. Parts printed in **Bold-Face type** are normally stocked for replacement purposes. The remaining parts shown in this manual are not normally required for routine service work. Orders for parts not shown in **Bold-Face type** will be processed, but allow for additional delivery time.