

Service manual
DN60/RT60
Spectrum analyser

GENERAL DESCRIPTION

The intention of this section is to provide a basic understanding of how the DN60 operates.

In essence the function of an audio spectrum analyser is to separate the components of any audible signal into defined frequency bands, and to indicate the level of energy present in each of those bands. A frequency analysis given by the DN60 displays the overall energy level of a signal and where that energy is distributed through the audio spectrum (in frequency bands of 1/3 octaves) in a bar graph format.

NOTE: Since frequency analysis represents the separate components of the overall signal, it follows that the "overall-level" displayed should be equal to the sum of the individual components.

The following description will be clarified by reference to the block diagram fig. 1.

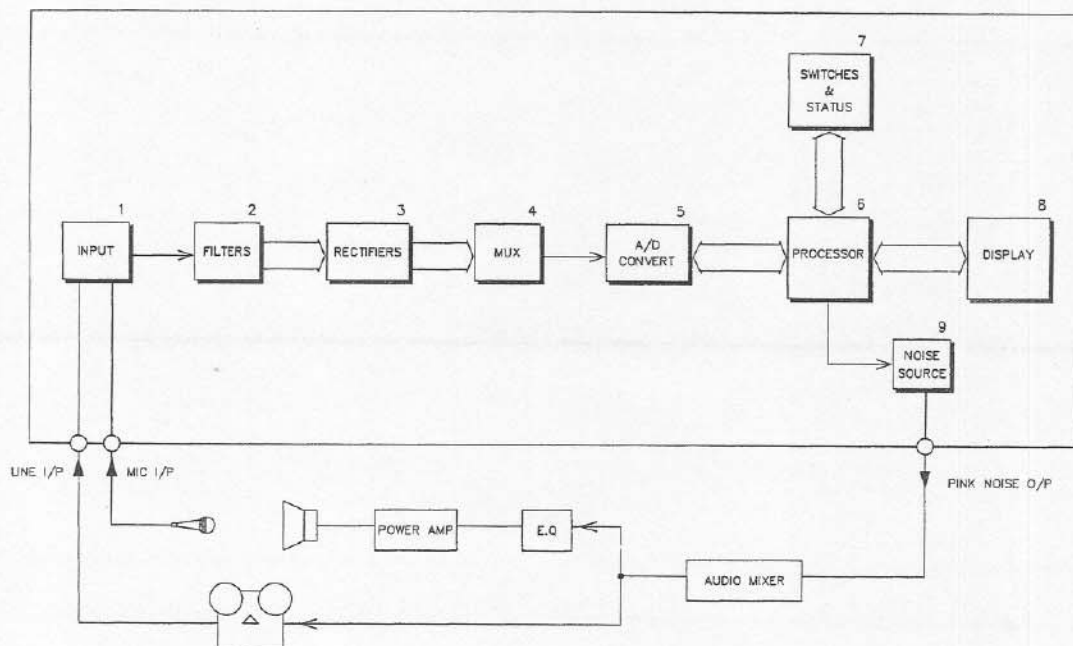


Figure 1.

In order to make a valid analysis of any system a reference signal source is required. This is fed into the system under test and the output compared to it. Most suitable for the purpose is 'Pink Noise'.

By definition Pink Noise consists of all frequency components (in the audio band) randomly produced, and filtered so that each frequency band contains equal energy. i.e. under subsequent analysis the spectrum display of pink noise will appear 'flat'.

INPUT

This section is to provide the analyser with easily managed, coherent analogue signals from sources of different levels and impedances. 'Microphone' or 'line' input can be selected; amplified or attenuated, and 'A' weighted, as required.

FILTERS

Thirty 1/3 octave frequency bands as represented on the display.

RECTIFIERS

Each of the filter outputs are fed into separate rectifiers. These produce D.C. voltage outputs, the level of which depend on the analogue input from the corresponding filter.

NOTE: A separate broad-band filter is employed to provide the overall level signal. This feeds two further rectifiers (one peak-reading - the other averaging). This is further explained in the Overall Level Technical Description.

At the outputs of the rectifier section, thirty-two separate varying D.C. voltages represent the changing energy levels of the filtered signal information.

MULTIPLEXER (MUX)

The thirty-two inputs are each sampled successively, in numerical order, and the samples fed through to the A/D converter. Each sample is 500uS long; the total cycle being approximately 15mS (a mark/space ratio of 1/32).

A/D CONVERTER

The (logarithmic 32 X 1dB step) converter translates the D.C. level provided by the 'mux' into a digital 'word', which is fed onto the data-bus when commanded by the processor.

PROCESSOR

The brain of the DN60 is the microprocessor. Supported by a permanent memory (ROM) containing the programme, it collects and manipulates information, with aid from a short-term memory (RAM). Incoming information is translated (decoded), into a form usable in the display section.

SWITCHES

Whilst working in programme and digital signal information, the processor also monitors and services control requests from the push switches (e.g. change from 1dB resolution to 2dB etc.), and selects relevant status LEDs to be lit.

DISPLAYS

Decoding data sent from the processor via the data-bus, the two display drive sections (X plane and Y plane) provide a multiplexed display pattern to the display LED matrix. Similar to the 'mux' described earlier, the 'X plane' selects each of the (frequency) columns successively and the 'Y plane' switches on the number of LED (energy level) rows required in each column (for the correct display pattern).

NOISE SOURCE

To provide the reference signal required, Psuedo-random 'white noise' is generated digitally, and fed via a low-pass filter to a gateable op-amp which drives the pink noise output.

MOTHER BOARD

Used to interconnect the processor with all other areas of the unit as required.

POWER SUPPLY

The power supply is not included on the block diagram. It uses split primary & secondary windings. The transformer has three secondary windings, each driving their own full wave bridge rectifier, smoothing capacitor and integrated circuit positive regulator. So producing +8V, -8V and 5V rails. Also from the +8V taps, a +14V unregulated phantom power line is produced.

The two primary windings are connected in series or parallel by SW2 to give 220 or 110 volt nominal operation.

ICI CARD

Not included in the block diagram, the ICI Card is used to interface the DN60 with external equipment.

TECHNICAL DESCRIPTION

INPUT (Circuit diagram sheet 1 Analogue Section)

The input section operates from two sources;

Line input is via a differential op-amp stage (U2A) which attenuates the signal by 18.5dB.

Mic input is via a similar configuration (U1), but with a variable gain of 10-20dB. This section also feeds the phantom power lines to the mic input socket.

Either line or mic source is selected by the first analogue gate (part of U3), the output of which is buffered and amplified by 3.5dB (U2D) before reaching the reference level section.

The reference level section employs a precision resistance ladder, situated on the 'A weighting' board (R8-R16), in conjunction with an op-amp (U2C) on the audio board. This configuration provides a dual function of attenuation/gain variable from -40dB to +30dB in 10dB steps.

The second analogue gate (part of U3) controls whether the signal is fed 'direct' (unweighted) or via the 'A weighting' filter (on a separate board) to:-

A 30dB amplifier section (U2B) before being fed (via a buffer on the mother board) into the filters.

FILTERS AND RECTIFIERS

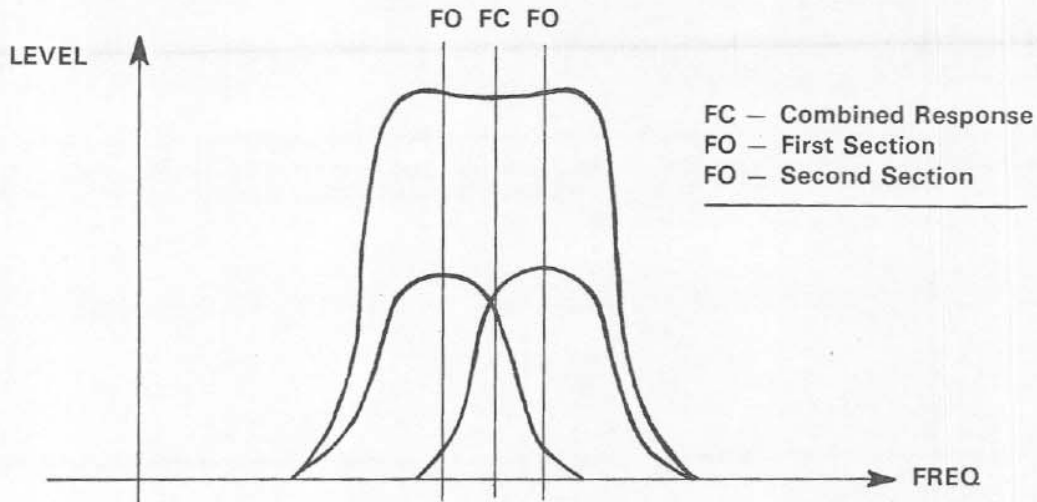
Filters and rectifiers are here dealt with together as they are situated on the same assemblies. (Circuit diagram sheet 6, Filter Section).

The combined filter/rectifier sections are located on 8 plug-in PCB assemblies mounted on the mother board. One of these (overall-level board) is described separately; the other seven are essentially alike, only frequency selective components and some rectifier time constants differ.

Each of these seven boards comprise, four filters of adjacent frequency bands (i.e. 25-50Hz on one board), and four corresponding rectifiers.

To achieve the required filter shapes, two band-pass filter sections are employed in series for each frequency band. The first section has its centre frequency slightly higher than the combined filter centre, and the second section slightly lower. The resulting frequency response has sharper slopes and a flatter top than provided by a single section.

(This configuration is referred to as a double pole-pair)



Each section has a gain of 9.5dB at FC, therefore the combined filter gain is 19dB at FC.

To compensate for component tolerances, each combined filter has a calibration pre-set which adjusts the combined filter sharpness (Q factor).

The filter output is fed into a precision rectifier which produces 900V D.C. output when the input level is -1dBm.

Note: To provide correct response times, lower frequency rectifiers have larger time constants and produce slightly higher output voltages.

OVERALL LEVEL (Circuit diagram sheet 6 Filter Section)

This board comprises two filters with corresponding rectifiers which are as those previously described, and the 'overall level' filter and rectifiers.

In the overall section the input signal amplified by a calibrated gain stage of 10dB. The following two-pole high pass and low pass filters produce a band-pass filter (approx. 13Hz-23Hz). At this stage the overall signal is still +10dB with respect to the input and feeds two rectifiers.

The peak reading rectifier produces approx. 900mV D.C. output for +10dB input.

The averaging section has slower responses and produces a lower output level. It is therefore followed by a gain stage to provide output level to the peak rectifier. This gain stage has provision for D.C. offset adjustment, allowing the peak and average outputs to be accurately balanced.

MULTIPLEXER (MUX) (Circuit diagram sheet 3 Mother Board)

To provide the serial form of information required by the converter from the thirty-two parallel rectifier lines, a 32 to 1 line multiplexer is employed.

U8 - U11 are 8/1 analogue switches (8 way; single pole), each servicing a block of 8 of the 32 input lines from the rectifiers.

From the tri-state latch (U7), three clock lines are used commonly by U8 - U11 to select 1 of 8 inputs. The 4 output lines (one from each chip) are connected in common to the A/D input.

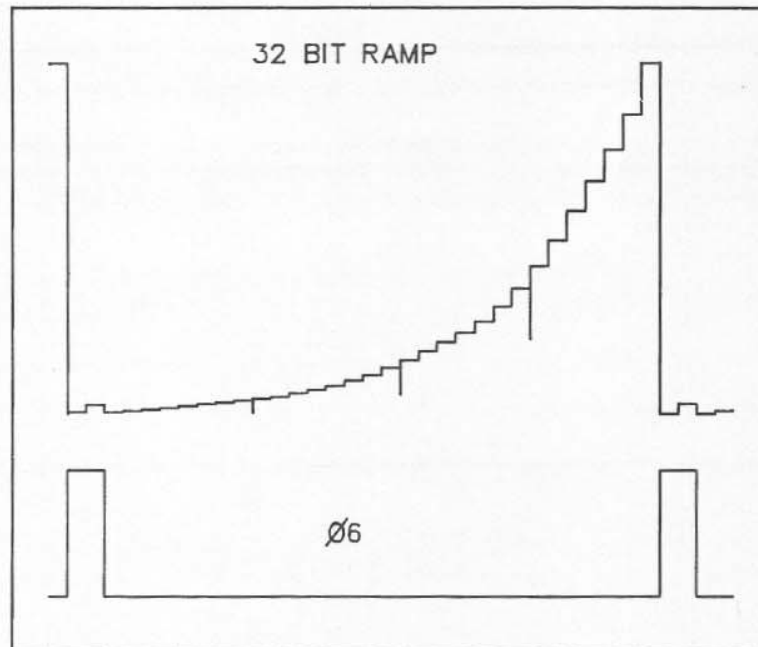
Two further clock lines from the latch are decoded by U5A+B and U6 to produce a 1 of 4 select. This enables only one of the switches to use the output line at any time, each being selected successively.

Thus, from data sent via the latch, a 5-32 line decode is performed to multiplex the 32 inputs onto a common output, in numerical order.

A/D CONVERTER (Circuit diagram sheet 5 convertor section)

The clock divider (U5) operates from $\phi 2$ input received from the processor via a comparator (U1 C). Divided clock outputs from this are used to control 'on board' functions and $\phi 6$ is also returned to the processor board to provide system synchronisation.

A resistance ladder (R11-R15) divides a precision D.C. voltage reference into 4 X 8dB steps. U3 is used as a 4 way switch, which controlled by two clock lines, produces an output stepping up from -24dB to 0dB (with respect to the reference) U4, controlled by a further 3 clock lines, uses a second resistance ladder (R16-R23) to further divide the stepped output of U3 into 1dB steps. Thus, as the clock count progresses the output from U4 appears as a logarithmic step ramp (32 X 1dB steps).



The analogue input voltage is amplified by a calibrated gain stage (U2A), before it is compared with the ramp (by U1B).

When (if) the ramp voltage steps above the compared input level, a latch (U7) is enabled via U6 (D type latch). the status of the 5 clock lines controlling the ramp is latched (by U7) and provides a 5 bit word which represents the input level converted.

If the input level is more than 1dB below the lowest step of the resistance ladder (31dB below the reference voltage), the output latch is enabled as normal and the output of comparator (U1A) will be latched as bit 7 (D6) of the data word, to indicate an 'under range' input condition.

If the input is greater than the D.C. reference clearly the ramp cannot step above it (i.e. U1B will not latch U6), and a sixth clock line then enables the output

U6), and a sixth clock line then enables the output latch as bit 8 (D7) of the data word, indicating an 'over range' input condition.

Note: bit 6 (D5) is not used in the conversion process.

So the converter translates the input level into a 7 bit word, 5 bits give a level in the range 0dB - 31dB in 1dB steps, which is only valid if the remaining 2 bits do not indicate an out of range reading.

Once the conversion cycle is complete ϕ_6 (M.S.B. of clock divider U5) signals the microprocessor to start the cycle again. The microprocessor derived $\overline{S8}$, then resets the clock divider and latches via a comparator (U1D). This initiates the next conversion cycle.

U8 and U9 serve to i) load the input thus speeding up the release times of the rectifiers (using R35), and ii) modify the gain of U2A (using R24-R28) to compensate for the loading.

Note:- This section is only operative when the RT60 option is used. It has no effect otherwise.

PROCESSOR BOARD (Circuit diagram sheet 4 micro section)

The microprocessor (U1) executes programme functions with consideration to interrupt requests and signal data.

The external socket (EXT SKT) allows interface for external units to assume control of the DN60, via the ICI Card. This is relevant only when using optional add-on units.

The processor is dependent for control on 2 buses.

- i) A 16-bit 'Address' bus is used, directly to find required memory addresses in the ROM and RAM sections, and indirectly to 'select' other sections inside the DN60. Basically, this bus provides 'send' or 'receive' commands to the section with which the processor requires contact.
- ii) An 8-bit bi-directional 'data' bus which carries information to/from the processor and the required section (selected by the address bus). Data will consist of memory information, signal information etc.

Data travels to/from the processor and several other sections. Because the bus is common (shared), it is necessary to control which section the processor is able to communicate with, whilst also inhibiting all other sections from using the bus at that time. (Effectively, 8-bit words are multiplexed onto bus in series).

To do this, data is sent to, and received from, the required section via 8-bit, tri-state latches, enabled to use the bus by the corresponding command (decoded from the address bus).

- * Data lines to the 'X plane' board do not require this latch, and will be explained later.

U2 is a 2K X 8-bit ROM (read only memory), containing the programme used by the processor, and is addressed by bits A0-A10.

- * $1K = 1024$ or 2^{10} . This is the number of different address locations available to store data. $2K = 2^{11}$, therefore, 11 address lines are required to find all locations.

U3 is a spare socket connected as U2 to allow use of extra programme memory, should it ever be required.

U4 and U5 are 1K X 4-bit RAM (random access memory), used as short term memory stores by the processor. Being 4-bits 'wide', two are used in parallel to service the 8-bit data bus. They are addressed by A0-A9.

Because the micro requires different amounts of time to process the various programme routines, U6 is used to 'hold off' the processor until the outside sections are 'ready' to receive further instructions. The input line $\phi 6$ from the A/D board is used to activate this function, and this provides synchronisation for the entire unit ($\phi 6$ being derived from $\phi 2$, which is itself produced by the processor).

U7 is a 3-8 line decoder using bits A13-A15. The resulting 8 lines are used to enable each section of the processor board (ROM, RAM, External Socket etc), to receive the address bus information only when required.

From bits A5-A9, U8 and U9 perform a 5-16 line decode function. Thirteen of these output lines provide the 'select' lines (used to enable the tri-state latches etc.), two lines operate via the External Socket and

etc.), two lines operate via the External Socket and one resets U6 (after each 500uS cycle).

The cycle speed at which the processor runs is controlled by U10A, C1 and R5, which produce the master clock.

SWITCHES/STATUS LEDS (Circuit diagram sheet 1 Analogue Section)

The switch board itself comprises of the 8 push switches and related status LEDs. It is serviced by 3 tri-state latches which are situated on the analogue input board. These latches are connected to the data bus controlled by select lines 1-3.

U6 (audio board) services the 8 switches, sending switch status information (if any switch is being pressed), to the processor when commanded.

U5 services 8 status LED lines (although these control 9 LEDs). It receives commands via the data bus regarding which LEDs to illuminate (dependent on which switch status).

U4 similarly services the remaining 6 status LED lines (controlling 8 LEDs).

The two remaining lines of U4 are used to control the Cmos analogue gates (discussed earlier), employed in the analogue input section.

DISPLAY (Circuit diagram sheet 2 display Section)

Matrix

The display LED matrix is serviced by two boards (X and Y plane), which produce a display in the following manner. The X plane drives the display columns (31 lines representing the 1/3 octave frequency bands), and the Y plane provides the energy level information (driving 16 rows). The X plane is scanned, each column being on for 500uS, during which time the relevant Y plane rows are switched on also.

Thus the total display is built up one column at a time and refreshed at a rate of approximately 70Hz. The eye therefore, only detects a continual dynamic display.

X Plane

U1 and U10 are 4-16 line latched decoders operating commonly from data bits 0-3. Each selects 1 of 16 output lines on in succession. Both chips are selected

together, but are enabled alternately by LD4 and LD4 which are derived from data bit D4 via a latch (U13 on the mother board). Thus, each of the 32 output lines are selected successively.

Each line, when selected, turns on a corresponding power transistor (combined in 8-quad chips U2-U9), providing a current sink for the LED column selected.

Y Plane

U2 and U3 are tri-state latches which receive data from the bus when selected (separately). When enabled (by U5), the 16 output lines switch on corresponding power transistors (combined in 2 Octal packages U1 and U4). When on these source current into the relevant LED rows. (Each transistor drives a separate row).

U5 is a dual multi-vibrator, section 'A' operating as a display 'failsafe' via 'B', which controls intensity.

Triggered by S6, 'A' in turn triggers 'B'. VR34 sets the output pulse width from 'B' (which enables U2 and U3), thereby governing the mark/space ratio of display illumination and so controls intensity.

If the processor is 'crashed', S6 will stop; 'A' will not trigger 'B'. As U2 and U3 are not enabled, no display will appear.

NOISE SOURCE (Circuit diagram sheet 3 Mother Board)

U1A, U2 and U3 form a psuedo-random digital noise source. At switch-on logic '1' followed by '0' is fed from C9 via D2 to the shift registers (U2 and U3). U1B, C, D, forms a clock which shifts these digits through the registers. By tapping information from the register at various points and recycling, a random process is formed. Once this process has been started D2 ensures that C9 has no further effect.

At U3 pin 10 random white noise appears. The succeeding 3dB/octave low pass filter, flattens the response to produce pink noise, which is essentially flat to 20kHz.

The 'signal' is amplified around a gateable op-amp (U4) and connected to the output socket. VR1 provides a fine gain control on later models.

U4 is gated on/off by two select lines. Using U5C and D as a latch, and Q1 and Q2 to convert 5V to -8V (required to gate U4). Noise is switchable, via processor control by the RT60 option.

MOTHER BOARD (Circuit diagram sheet 3 Mother Board)

The Mother Board provides the foundation of the DN60, carrying the bus systems, power rails etc., to all relevant sections. Whilst also housing the filters, A/D and processor boards on a plug-in system.

This board includes the line buffer, U12 (see 'input'), and a data latch (see 'X plane' drive) as well as a noise generator and multiplexer sections.

INTERFACE (Circuit diagram sheet 7 PSU/Interface Section)

The ICI card option provides interface capability with external devices. It is linked via the processor board EXT SKT to the data bus, address bus, decoded address (select) lines and other processor control functions.

U1 is a 2K X 8-bit ROM containing additional programme information.

U2 is not normally used but can contain further programme information.

U3 and U4 are 1K X 4-bit RAM used in parallel for short term storage of 8-bit data information.

U6 is a parallel interface port, providing interface capability with external units via the external socket (SKT 3).

The RT60 socket (SKT 2) is for use with the RT60 only and connects the data bus and addressing information to the RT60.

PRELIMINARY INSPECTION

Before despatch of a unit to a customer, or upon return for repair/service, it is advisable to carry out the following preliminary inspection (and accordingly rectify any obvious fault). Carefully open the unit and check there are no:-

- loose or broken wires or joint
- boards broken or adrift inside the unit, or loose on its connectors
- burnt, broken or missing components
- loose screws or nuts
- and that the correct mains voltage is selected.

Assuming no problems arise thus far, apply power to the unit and check its operation.

Check:- 'warm up' routine, pink noise source, line and mic inputs. Ensure all LEDs illuminate and switches operate correctly.

TYPICAL FAULTS

The DN60 is a complex instrument, and as such a comprehensive fault diagnosis would be extremely large and complicated; and mostly redundant! Some typical symptoms can be briefly outlined, and simple checks should quickly identify most faults. Complicated problems are quite unlikely to occur and would require sophisticated test equipment to be rectified.

IN GENERAL

If a fault appears:-

- 1) Switch the unit off, wait a few seconds and then switch it on again.
 - a) If the unit now operates correctly it may be mains borne interference provoked a temporary processor error.
 - b) If the fault persists, carry out a visual inspection before using the test equipment.
- 2) Check the power supply before looking further for faults.
- 3) Having isolated the area or assembly at fault, before referring to circuit diagrams, visually check again for obvious causes (broken or burnt components, stray wires, loose connectors etc).

POWER SUPPLY

Many problems can be identified before opening the unit, by observing carefully the 'warm up' procedure and noting what follows it.

- 1) Positive 8V rail - failure identified by:-

No display, 'OK' not shown, status LED on permanently. (3 stay off).

Check F2 is intact. Check 8V is present at SKT1 pin 3 and SKT2 pin 4.
- 2) Negative 8V rail - failure is indicated by:-

Normal warm up procedure followed by full display (overload), status LEDs as normal.

Check F3 is intact. Check -8V is present at SKT1 pin 1 and SKT2 pin 5.

3) 5V rail - failure may be indicated by:-

No display at all, no status LEDs.

Check power card is connected. Check F4 is intact. Check 5V present at SKT1 pin 6 and SKT2 pin 1. Remove power and check F1.

Further symptoms may be caused by supply failure to only one section, it is always wise to check.

Most faults can be recognised by watching the display (and status LEDs during and after 'warm up'. These may be interpreted as being in the display section itself.

1) Single LED failure - the indication is self explanatory.

2) Row of LEDs fail -

- a) Loose connectors
- b) Fault in corresponding section of the 'Y' plane drive board.

3) Column of LEDs fail -

- a) Loose connectors
- b) Fault on 'X' plane drive board
- c) Fault on corresponding filter(s)
- d) Fault in corresponding mux channel(s)

4) Sections (regular columns) fail -

- a) Faults as listed under 3
- b) Data line(s) missing
- c) Fault in 'X' plane decode.

Part '3' here can be used to illustrate how further resolution of the problem is possible.

The failure of a column indicates one of three possible faults (excluding loose connectors), which can be isolated by two further checks.

- i) During start-up, if the column in question lights, then clearly the fault is in the corresponding filter (e.g. 100Hz) or multiplexer channel.
- ii) Swapping the suspect filter board for another (say 6K3Hz), will indicate whether the problem is in the 100Hz filter or the 100Hz mux channel.

As all possible faults cannot be covered here, the intention is to illustrate that applying common sense should dictate the direction for fault finding, with reference to circuits, overlays, descriptions and line-up information.

I.C.I. RETROFIT KIT

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>PART</u>
1.	I.C. U3 Microprocessor card	Prom 024 (LGB 1 & RT60)
2.	4 X Pillars	23mm Type B
3.	I.C.I. card fully loaded & tested (programme 023)	

DN60 PROGRAMMES REQUIRED FOR RT60 OPTION/LGB 1 OPTION

Processor Board - U2 is T.Bug 022, U3 is T.Bug 024

I.C.I. Card - U1 is T.Bug 023

I.C.I. FITTING

1. Remove DN60 covers, (8 screws).
2. Remove blanking plate. (4 screws) sketch fig. 2 from rear of DN60.
3. Insert T.Bug 024 (24 pin I/C) into spare 24 pin socket marked 'U3' on microprocessor board. see fig. 3. Ensure correct orientation of pin 1 (see fig. 4), (this may already be present on later units).
4. Remove 4 nuts and washers which secure microprocessor board (fig. 3), and replace with pillars provided (Do not discard nuts and washers).
5. Carefully plug ribbon connector into 40 pin socket on microprocessor board marked 'EXT SKT' (see fig. 3).
6. Place ICI card on pillars so that RT60 and LGB connectors are accessible through the rear panel, and secure with the 4 nuts and washers.

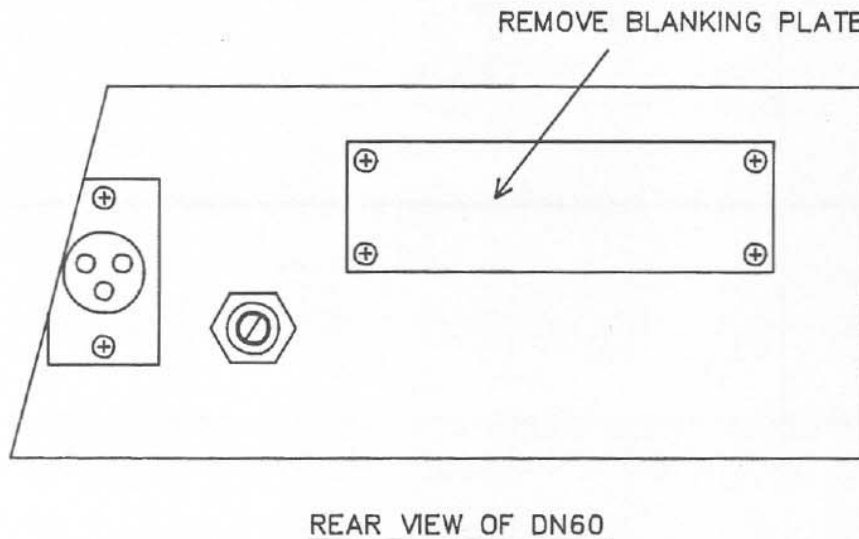


Figure 2.

DN60 MICROPHONE CALIBRATION PROCEDURE

Equipment required: B & K 4230 calibrator with 1/2" adapter.

- 1) Remove top cover from DN60 and set controls as follows:-

Response to '1'; resolution to 1dB; peak (pk) reading; 'A weighting' off; reference level to 110 SPL.

- 2) Place calibrator over microphone and turn on, adjust mic level preset (shown on fig. 7b), so the 1kHz - 16dB LED is just turning off. Replace top cover.

DN60 A/D AND FILTER CALIBRATION

(MkII filters, PCB Nos. 2568, 2555 and 2622)

OVERALL CHECK LEVEL

Connect oscillator to line input of DN60 and switch DN60 to 'LINE'.

Set oscillator to 1kHz + 2Hz and arrange oscillator output level and DN60 'reference level' attenuator so that -10dBu is produced at Test point 1, TP1 on the DN60 mother board.

Measure the overall level peak D.C. rectifier output @ pin 5 of molex connector SKT 13 (use high impedance probe - 1 meg or above. The output should be 900mv +30mv.

On later models VR4 is provided on O/L board and should be adjusted to give 900 mv +5mv.

Measure the overall level average D.C. rectifier output @ pin 6 of molex connector SKT 13, the output should be within 20mv of the reading taken at the peak DC rectifier output.

A/D ADJUSTMENT

Arrange oscillator to give 1kHz @ +9dBu @ line input of DN60.

Set DN60 to 'Line', 'PK', Response '1' and resolution '1dB'.

Set DN60 reference level attenuator to +10dB.

Adjust A/D 'input level cal' VR9 so that the O/L -1dB(+9) LED is at its turn on threshold (flickering on and off).

FILTER ADJUSTMENT

Set oscillator to 25Hz @ -1dBu at line input of DN60.

Set DN60 to 'Line', 'PK', Response '1' and resolution '1dB'.

Set DN60 reference level attenuator to +10dB.

Adjust sharpness pre-set so that -11dB (-1) LED (25Hz column) is at its turn on threshold.

Adjust the input frequency slightly to find the filter peak and re-adjust the preset until turn on threshold is at filter peak. (This is not necessarily at the cf of the double pole pair filter network).

Repeat 3 for all other filters.

DC OFFSET

Set oscillator to 23kHz @ -27.5dBu.

Set DN60 to 'Line', 'PK', Response '1', 'peak hold' on and resolution '2dB'. Press 'Store'.

Sweep oscillator slowly down to 23Hz (must be at least 10 second sweep). All -38dB (-28) LED should be On.

Set oscillator to 23kHz @ -28.5dBu.

Sweep oscillator slowly down to 23Hz (as above). All -38dB (-28) LED should be OFF.

Note Individual filters with DC offset problems may be cured by replacing IC U3 or adjustment of R9, R19, R29, R39, by up to +100% - 50% of existing value. If large amounts of filters have offset problems the filters need not be adjusted. Instead adjustment of A/D converter is recommended by selection of capacitor value across pin 1 and 2 of U2A on the A/D board, values from 8p2 - 120pf.

OVERALL LEVEL DC FINAL ADJUSTMENT

Set oscillator to give 1kHz @ -18dBu.

Set DN60 to 'Line', 'PK', Response '1' and resolution '2dB'.

Set reference level attenuator to +10dB.

Adjust oscillator input level by + 1/2dB to find the turn on threshold of the O/L -28dB(-18) LED. Adjust R39 if required to obtain threshold @ -18dBu - 1/2dB.

Reset oscillator to -18dB and switch DN60 to 'Average'.

Adjust VR3 to set the turn on threshold of the O/L -28dB (-18) LED at exactly -18dBu.

Measure frequency response @ Tp3 with reference to 1kHz

NOTES ON FILTER IN DN60

Filter Shapes to I.E.C. 225

$$\begin{aligned} f_m &= \text{mathematical centre frequency} \\ f_1 &= f_m / \sqrt[6]{2} \approx 0.891 \cdot f_m \\ f_2 &= f_m / \sqrt[6]{2} \approx 1.1225 \cdot f_m \end{aligned}$$

f_m is calculated from f_1 and f_2 as follows:-

$$f_m = \sqrt{f_1 \cdot f_2}$$

f_1 and f_2 are measured as follows:-

$$\text{level at } f_1 = \text{level at } f_2$$

These are approximately the 4dB down points.

f_m is then calculated and checked for tolerance.
 f_m should be within +5% of stated frequency.

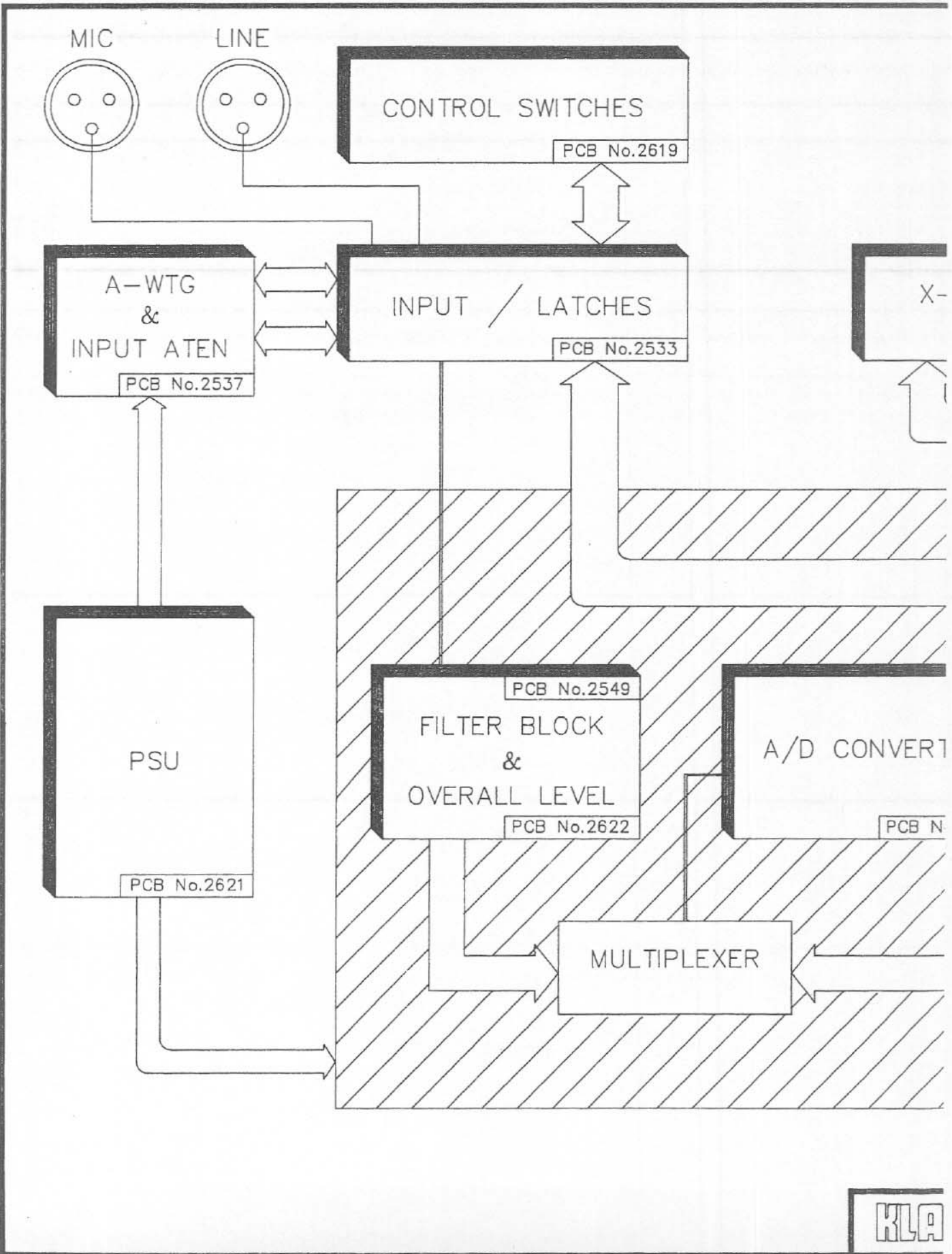
- Note
- 1) Centre frequency or effective bandwidth tolerance in I.E.C. 225 is +10%.
 - 2) f_m is not necessarily the maximum level, as ripple in the passband can be within + 0.5dB and -1.0dB.

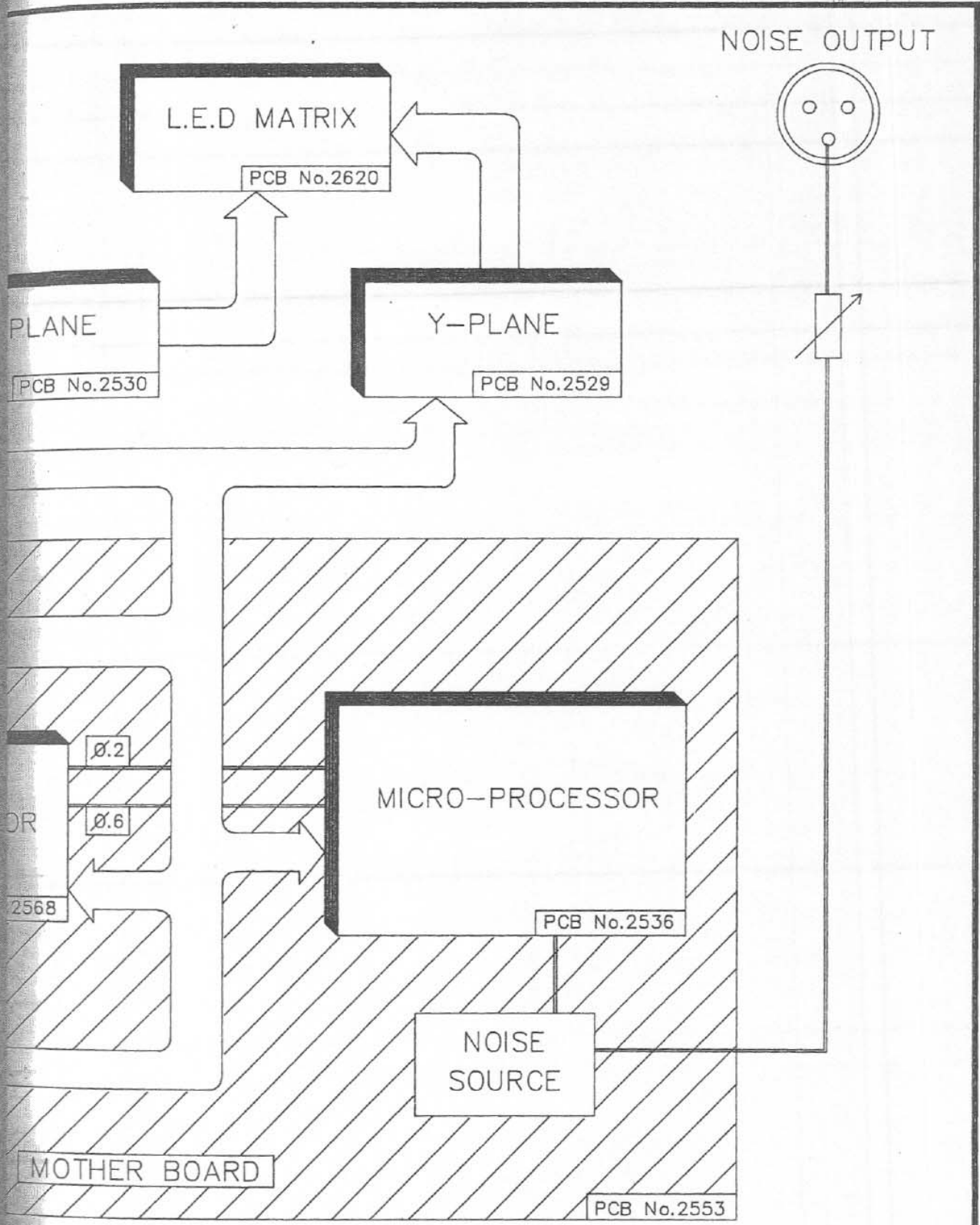
DN60 FILTER/RECTIFIER TIME CONSTANTS

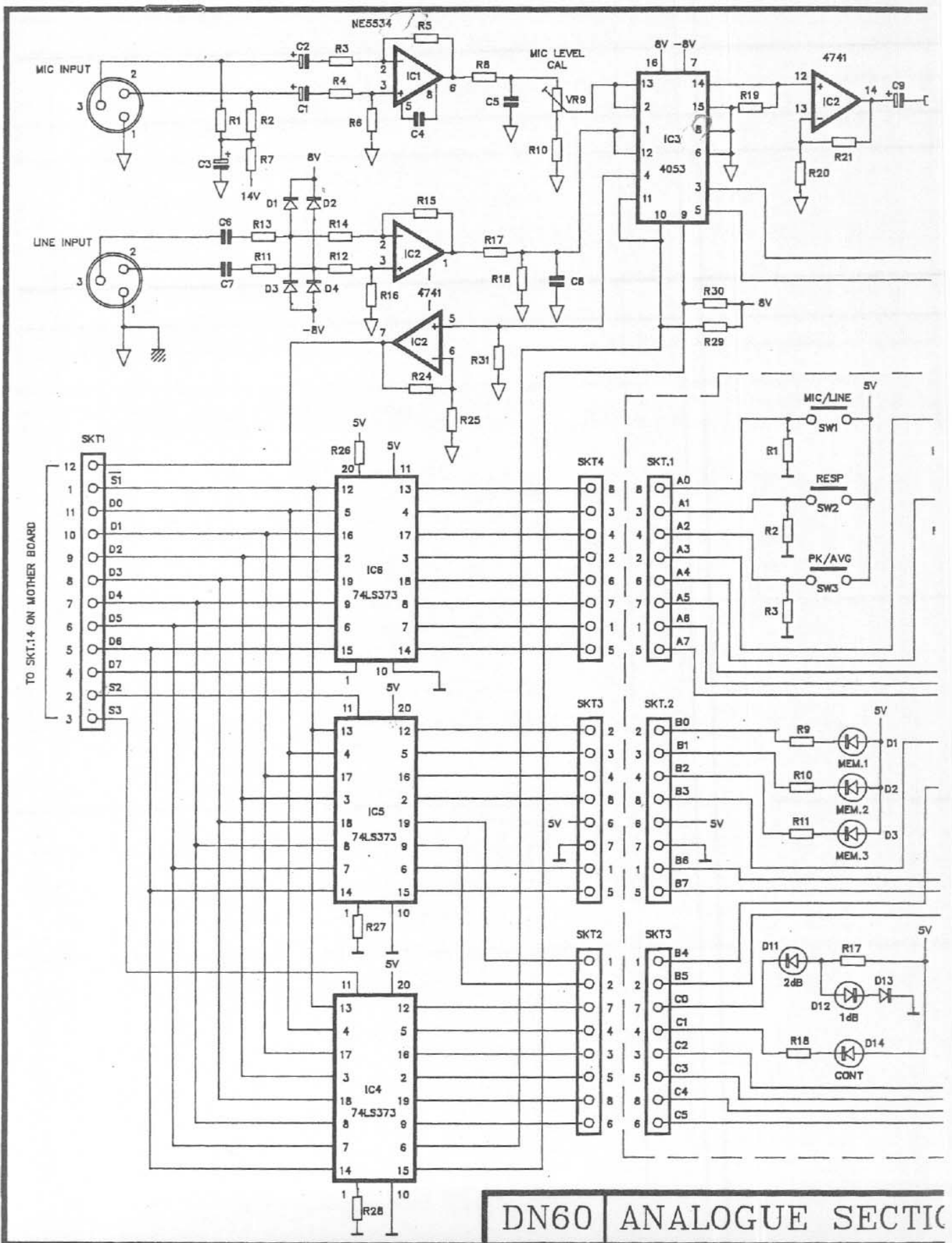
This table gives the attack and release times of the filter/rectifiers in the DN60, for all three positions of the response time switch, and both positions of the Peak/Average switch. The time constant is stated as the time taken for the column of LED's to reach 0.66 (-4dB approx) of its steady state value on attack and to fall to 0.33 (-9dB approx) of its value on release. In order to gain optimum performance in visual representation of the incoming signal, these times vary with frequency.

All times are in milliseconds and only approximate.

Frequency Column	RESPONSE		
	1 (Fast) Att/Rel	2 (Med) Att/Rel	3 (Slow) Att/Rel
Overall Level Ave.	300/350	400/550	1000/1800
Overall Level Peak	1/350	1/550	1/1800
25-40Hz Average	180/1000	250/1300	1000/3000
25-40Hz Peak	160/1000	160/1300	160/3000
50-100Hz Average	110/700	240/1000	1000/2500
50-100Hz Peak	80/700	80/1000	80/2500
125-200Hz Average	110/350	240/550	1000/1800
125-200Hz Peak	40/350	40/550	40/1800
250-20kHz Average	110/220	250/400	1000/1600
250-20kHz Peak	15/220	15/400	15/1600

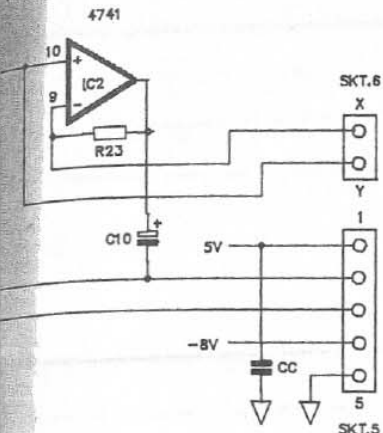




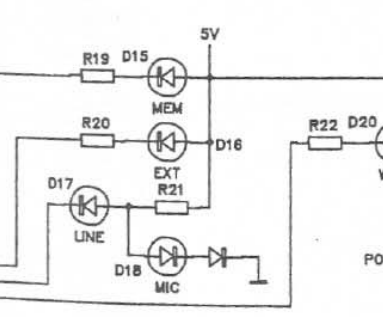
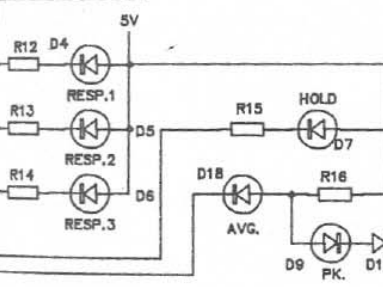
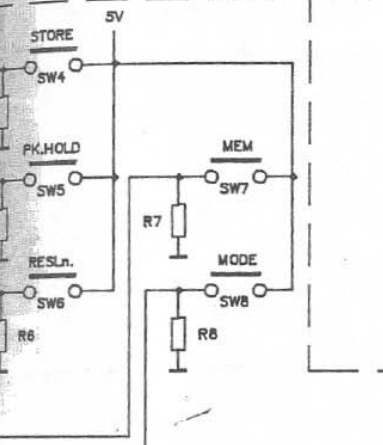
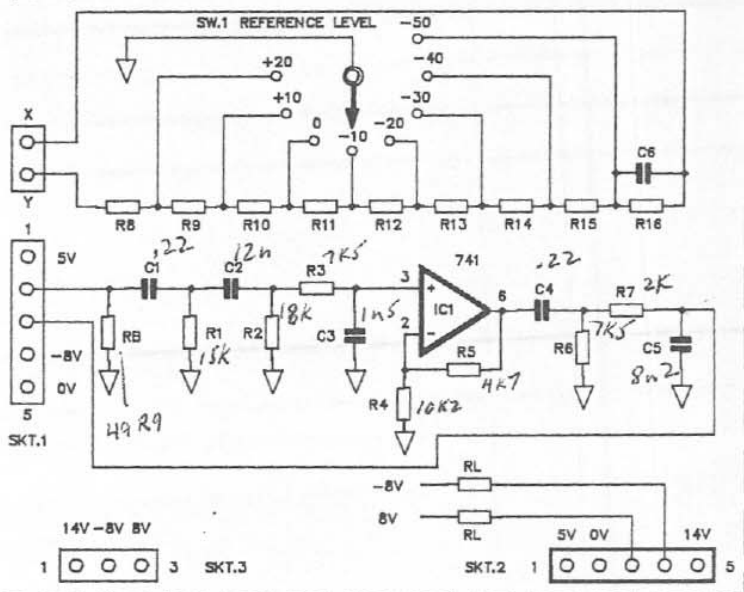


DN60 ANALOGUE SECTION

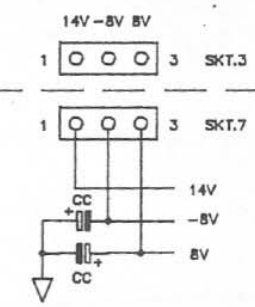
PCB No.2533 ANALOGUE BOARD



PCB No.2537 A.WEIGHTING



PCB No.2619 SWITCH BOARD

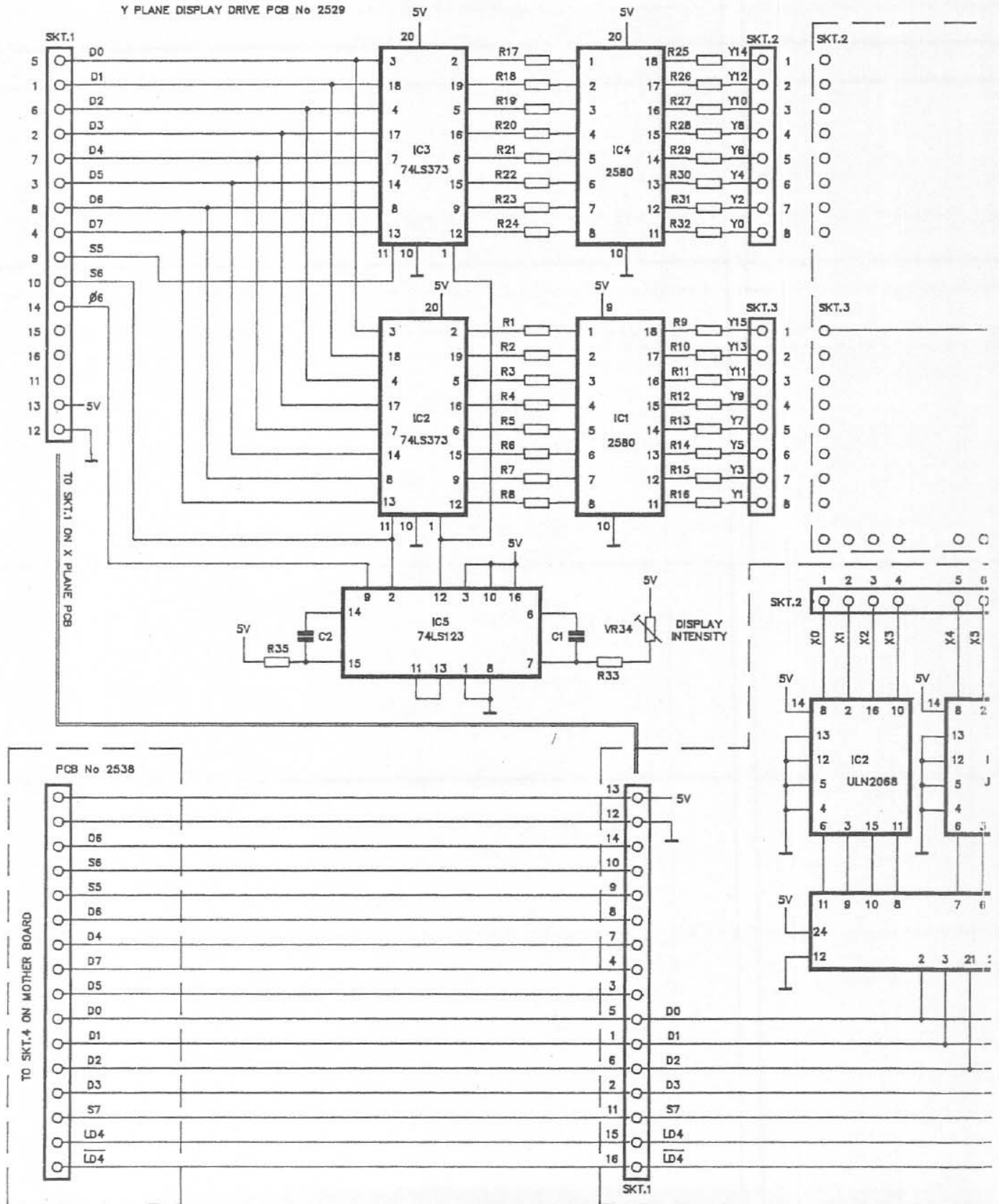


FROM SKT.2 ON PSU BOARD

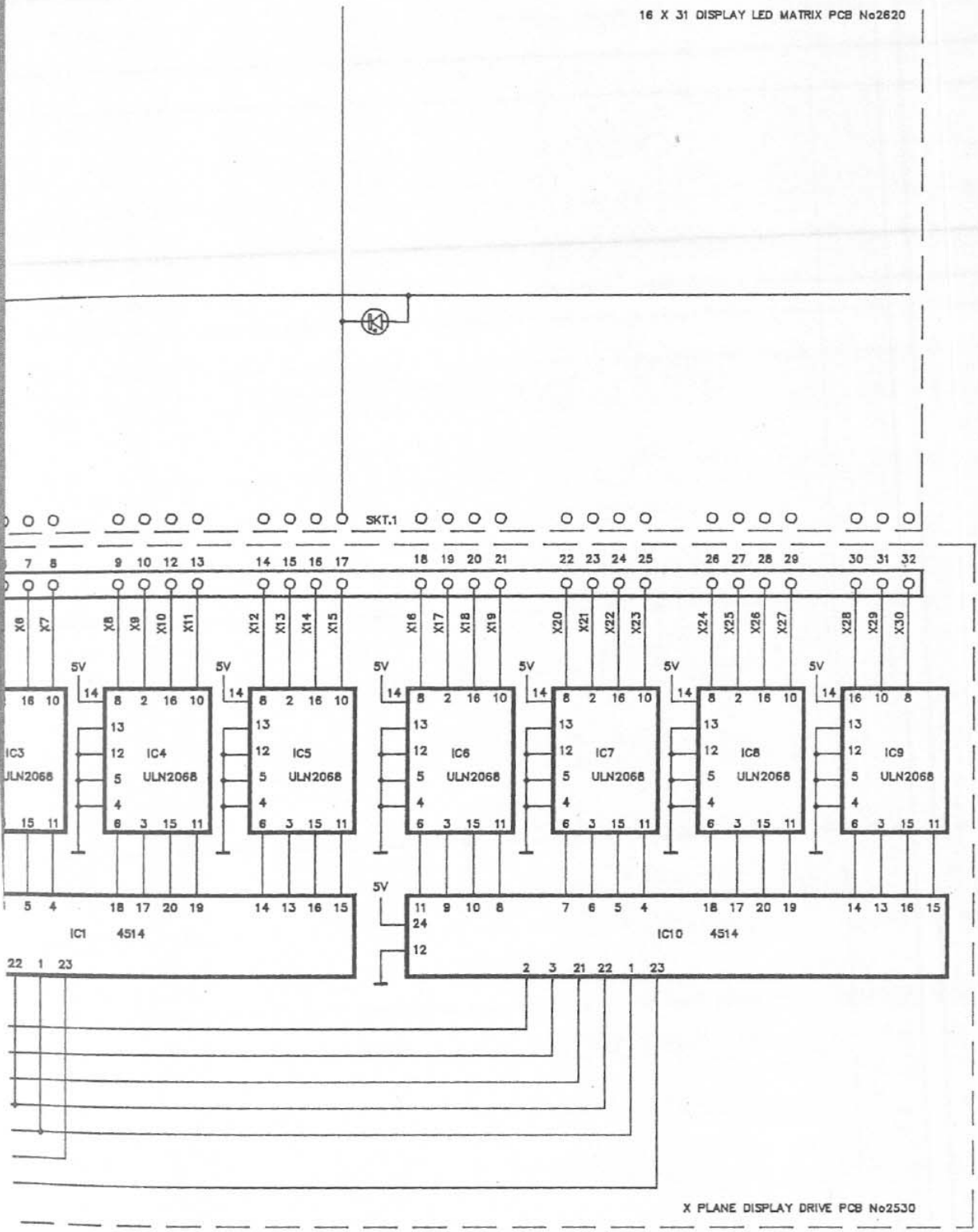
FROM PCB No.2533 → TO PCB No.2530 X. PLANE BOARD

- ⊥ DIGITAL GROUND
- ▽ ANALOGUE GROUND
- ▨ CHASSIS GROUND

Y PLANE DISPLAY DRIVE PCB No 2529

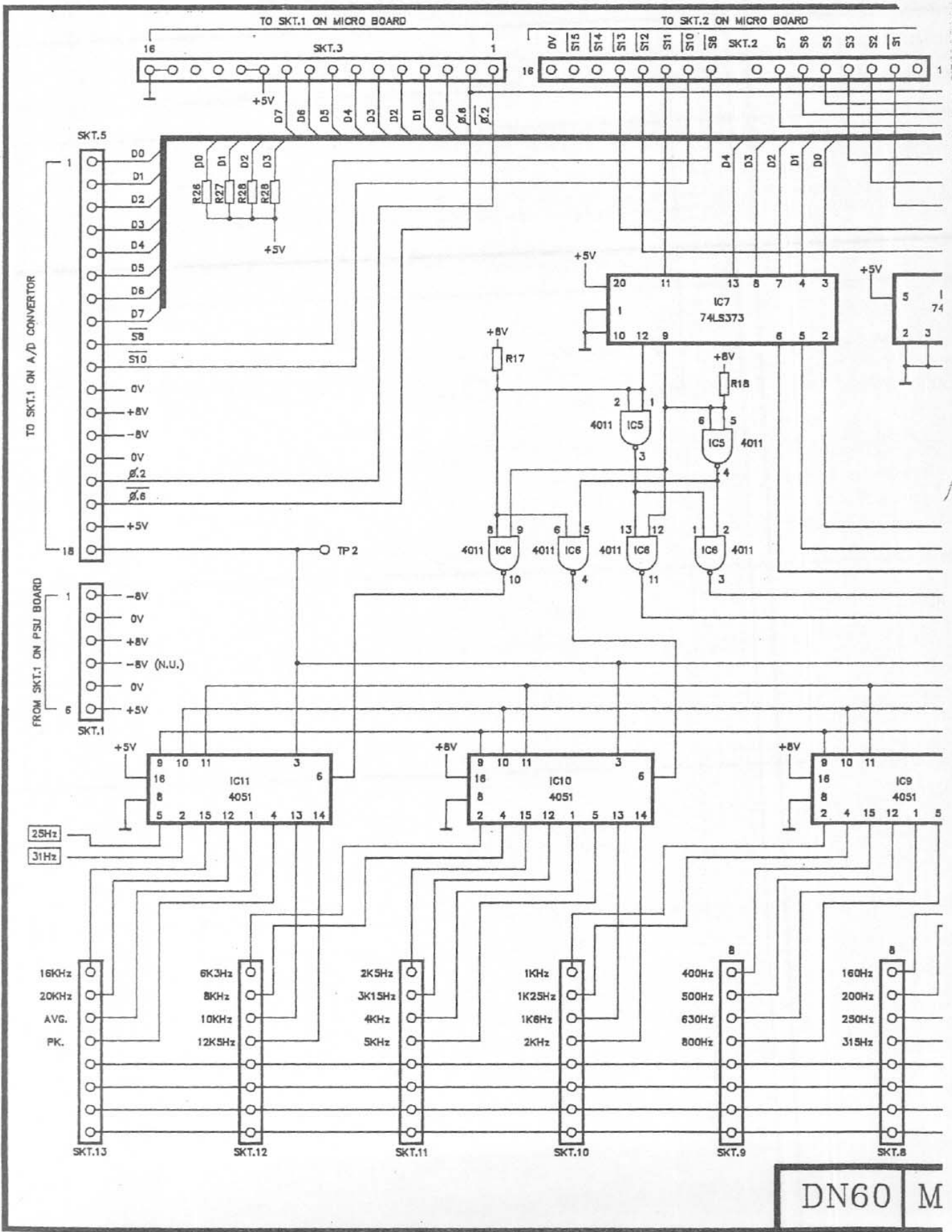


16 X 31 DISPLAY LED MATRIX PCB No2620

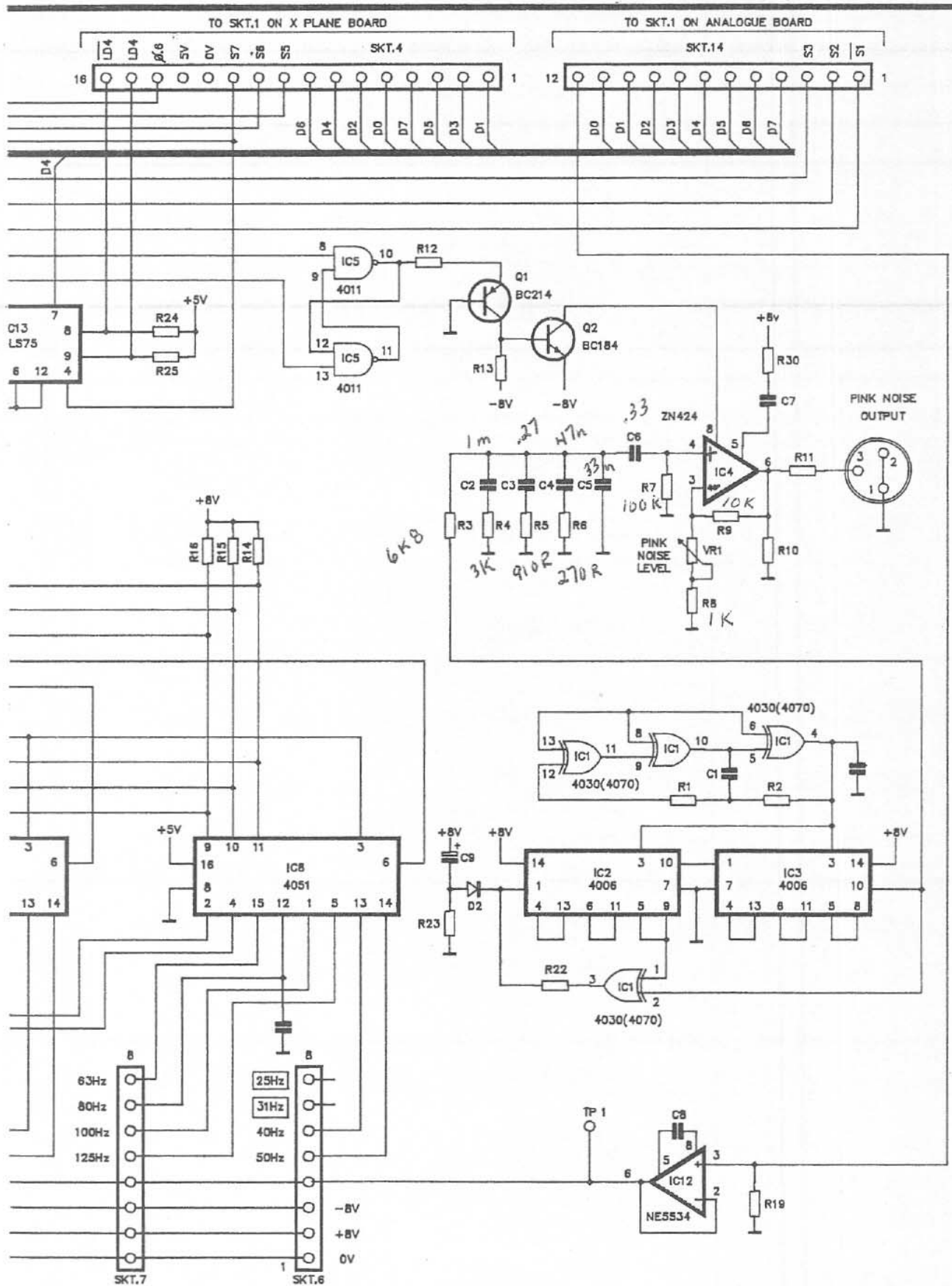


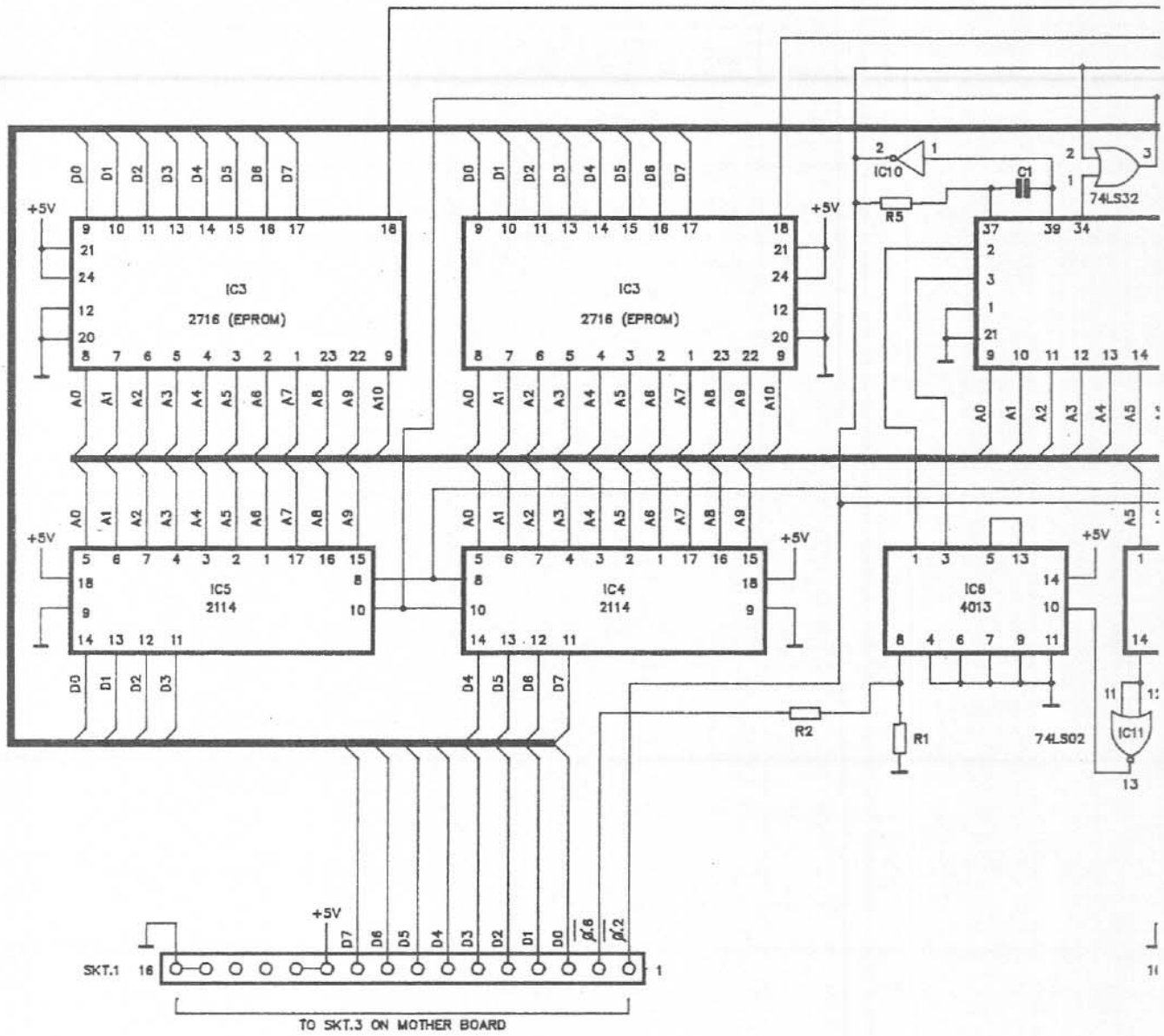
X PLANE DISPLAY DRIVE PCB No2530

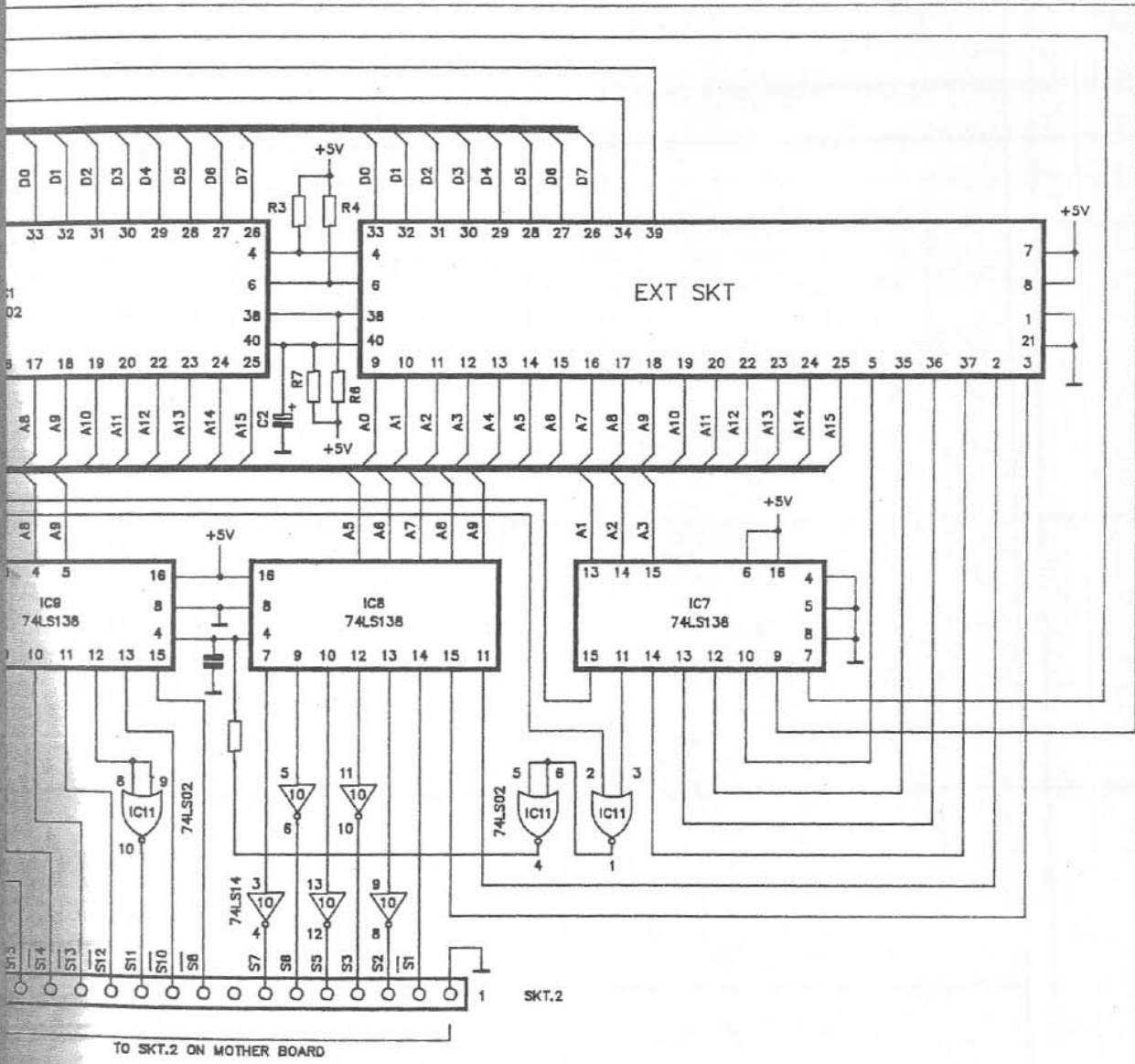
t 2) BRD: 2529+2530+2538+2620 24.NOV.86

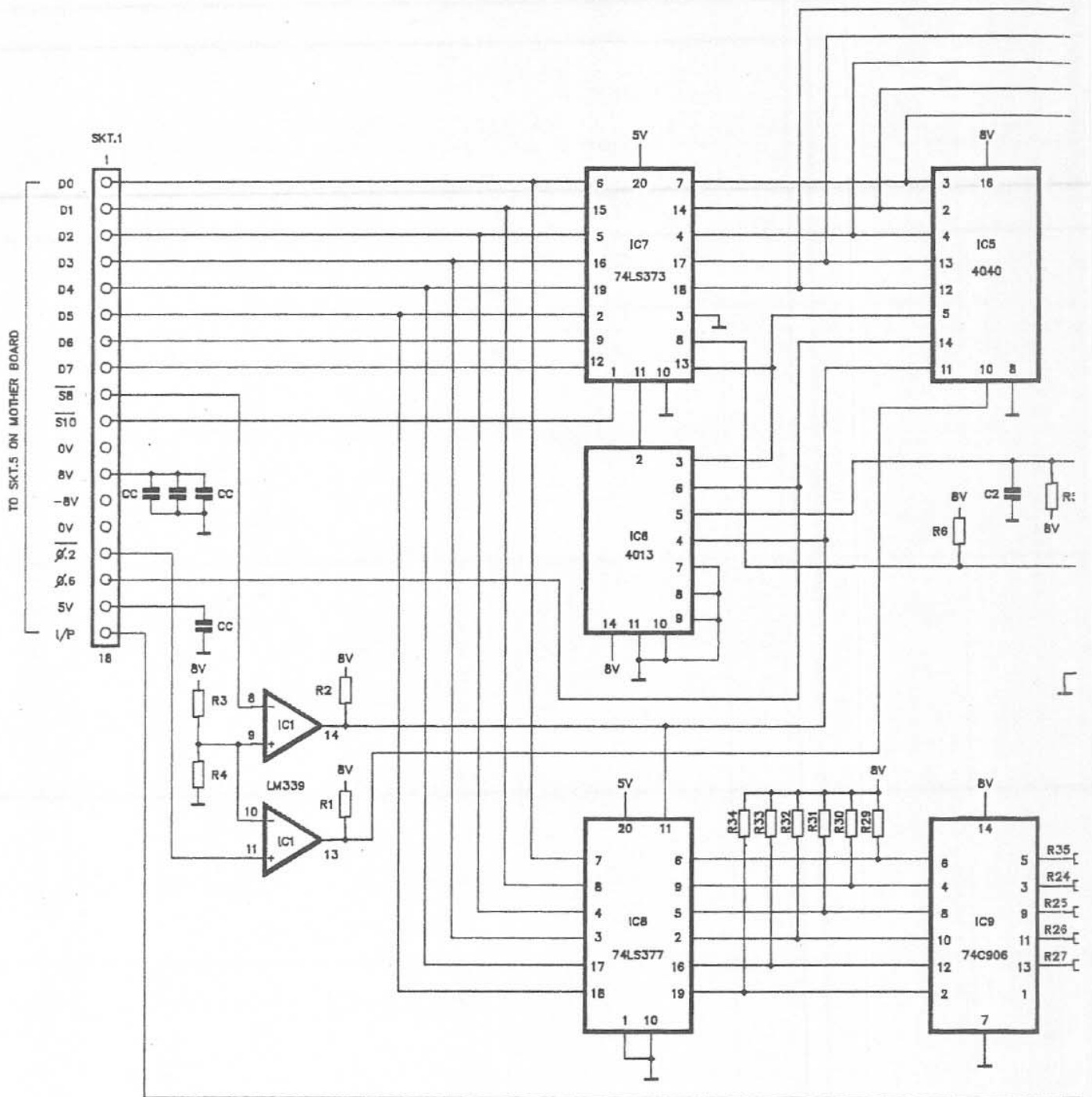


DN60 M

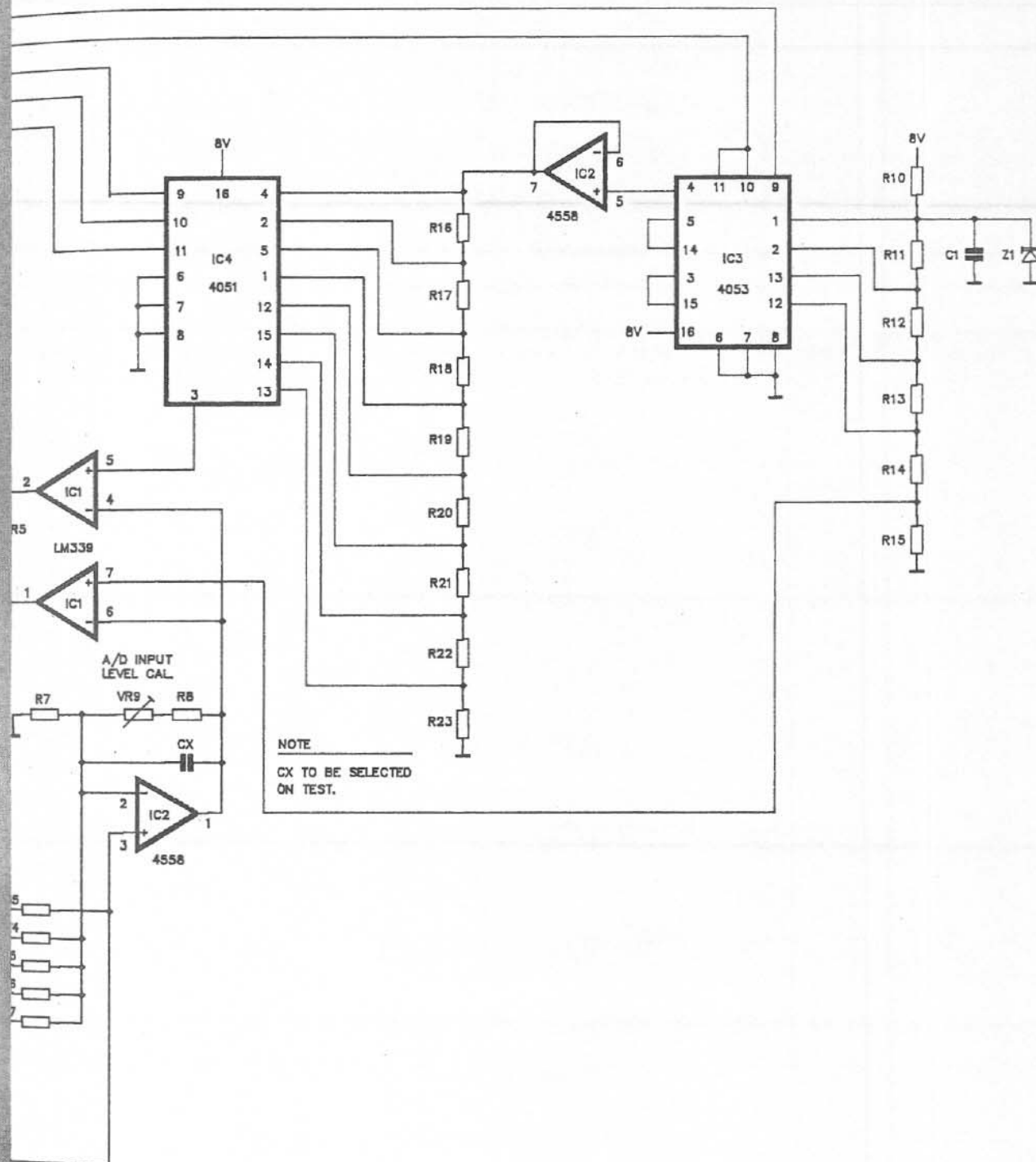


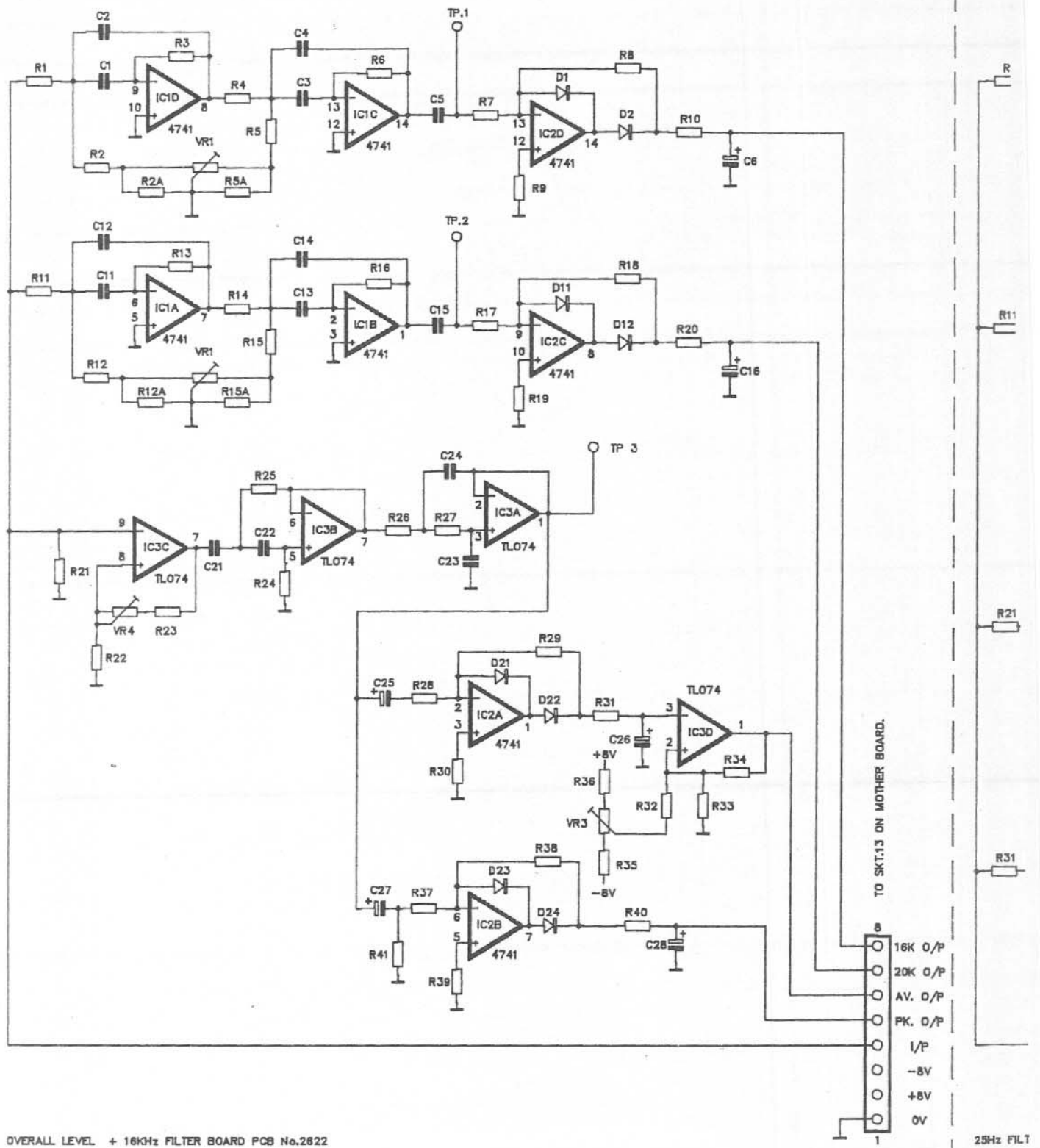






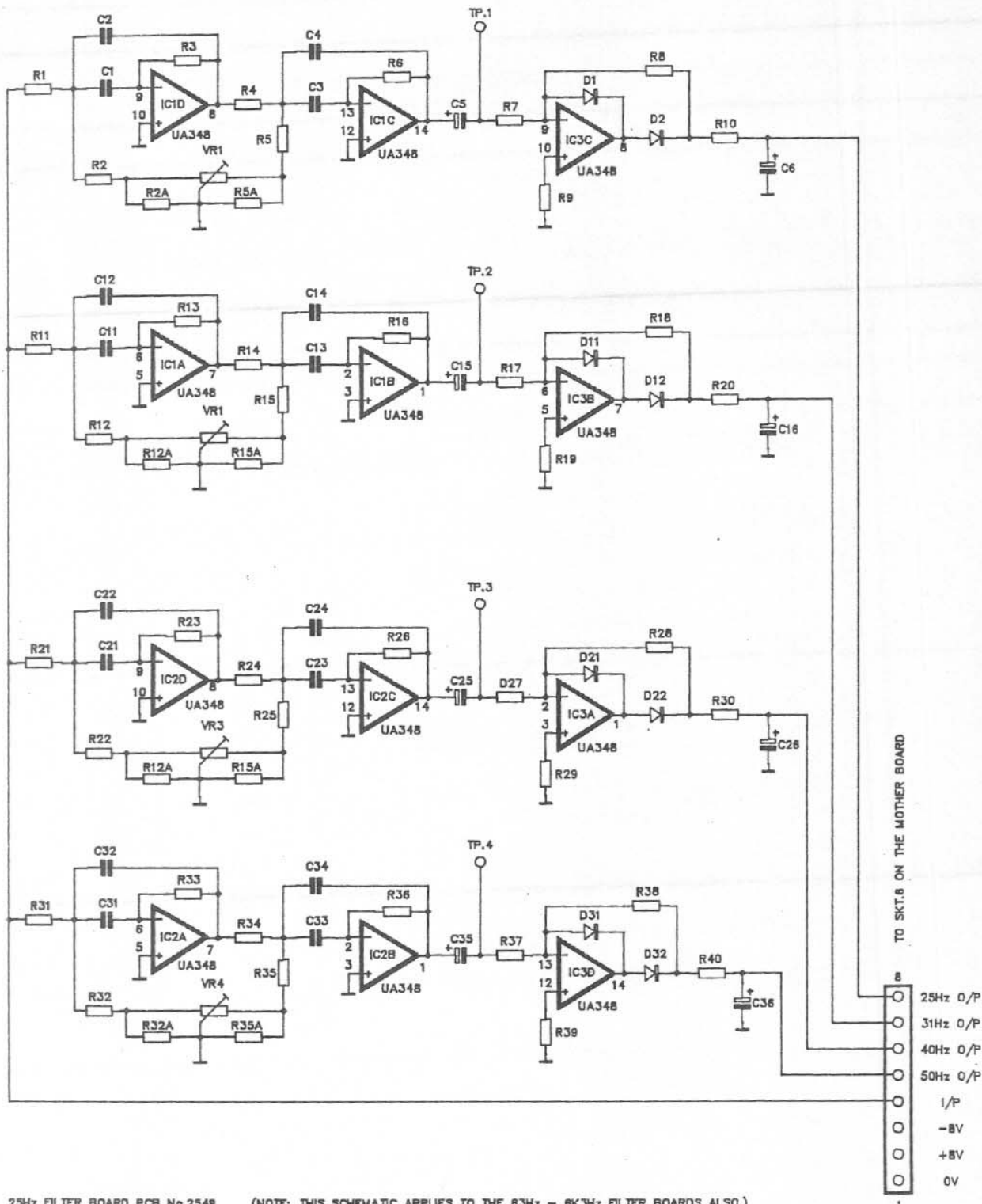
DN60 CONVER



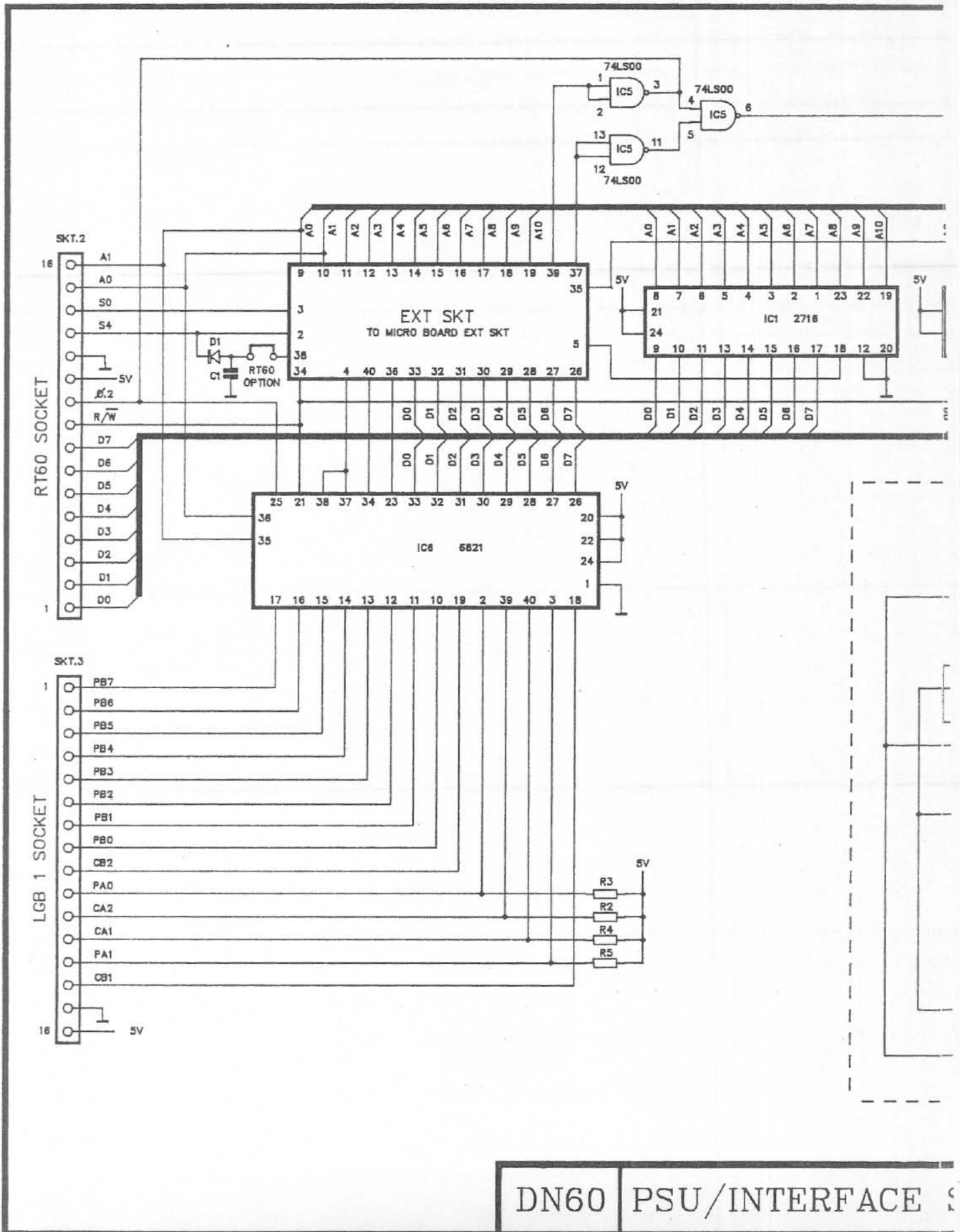


OVERALL LEVEL + 16kHz FILTER BOARD PCB No.2622

DN60 FILTER SE

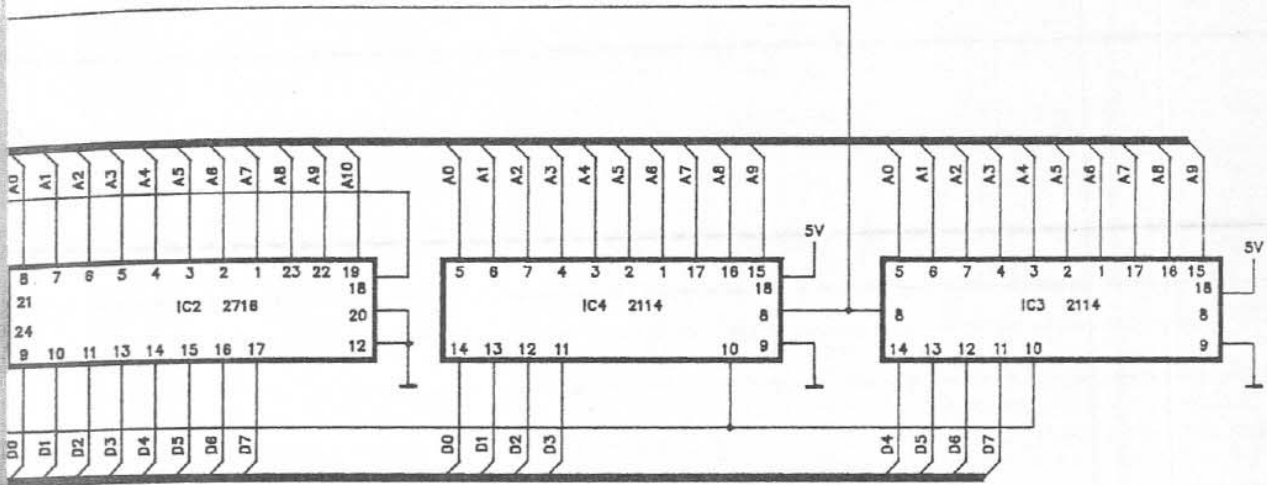


25Hz FILTER BOARD PCB No.2549 (NOTE: THIS SCHEMATIC APPLIES TO THE 63Hz - 6K3Hz FILTER BOARDS ALSO.)

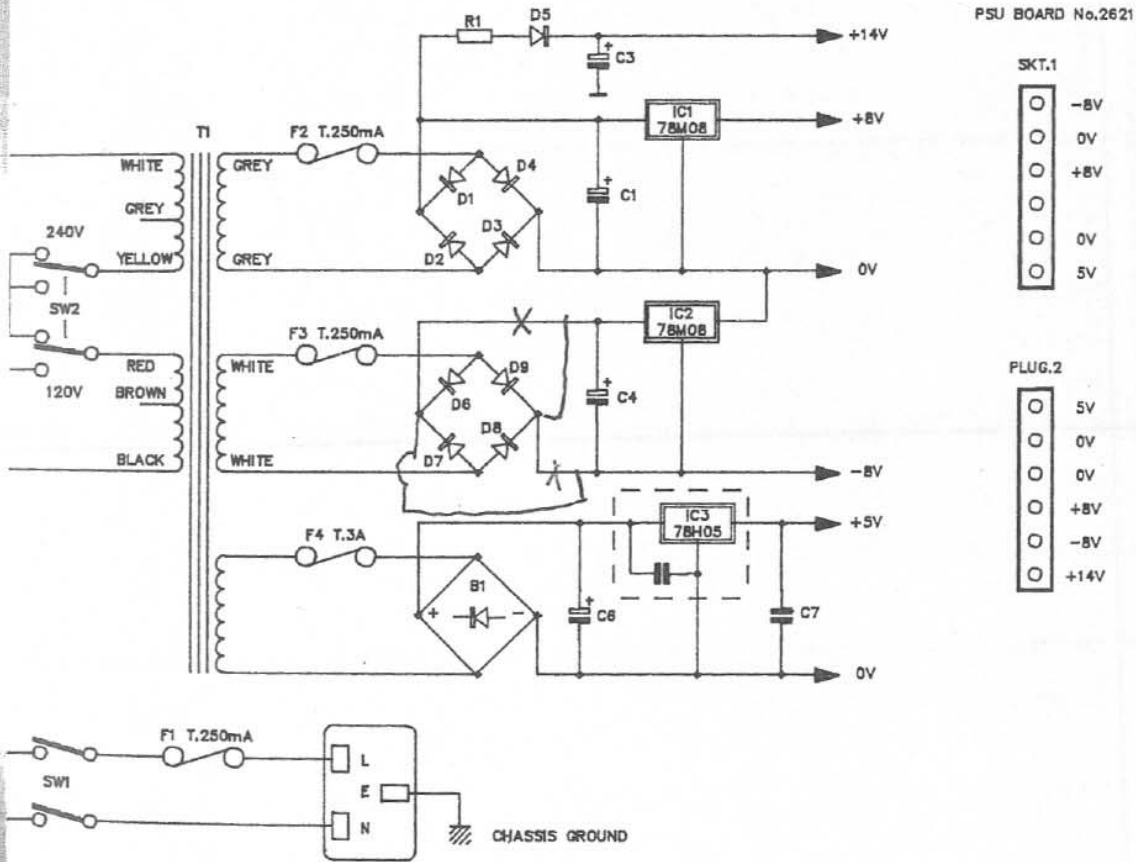


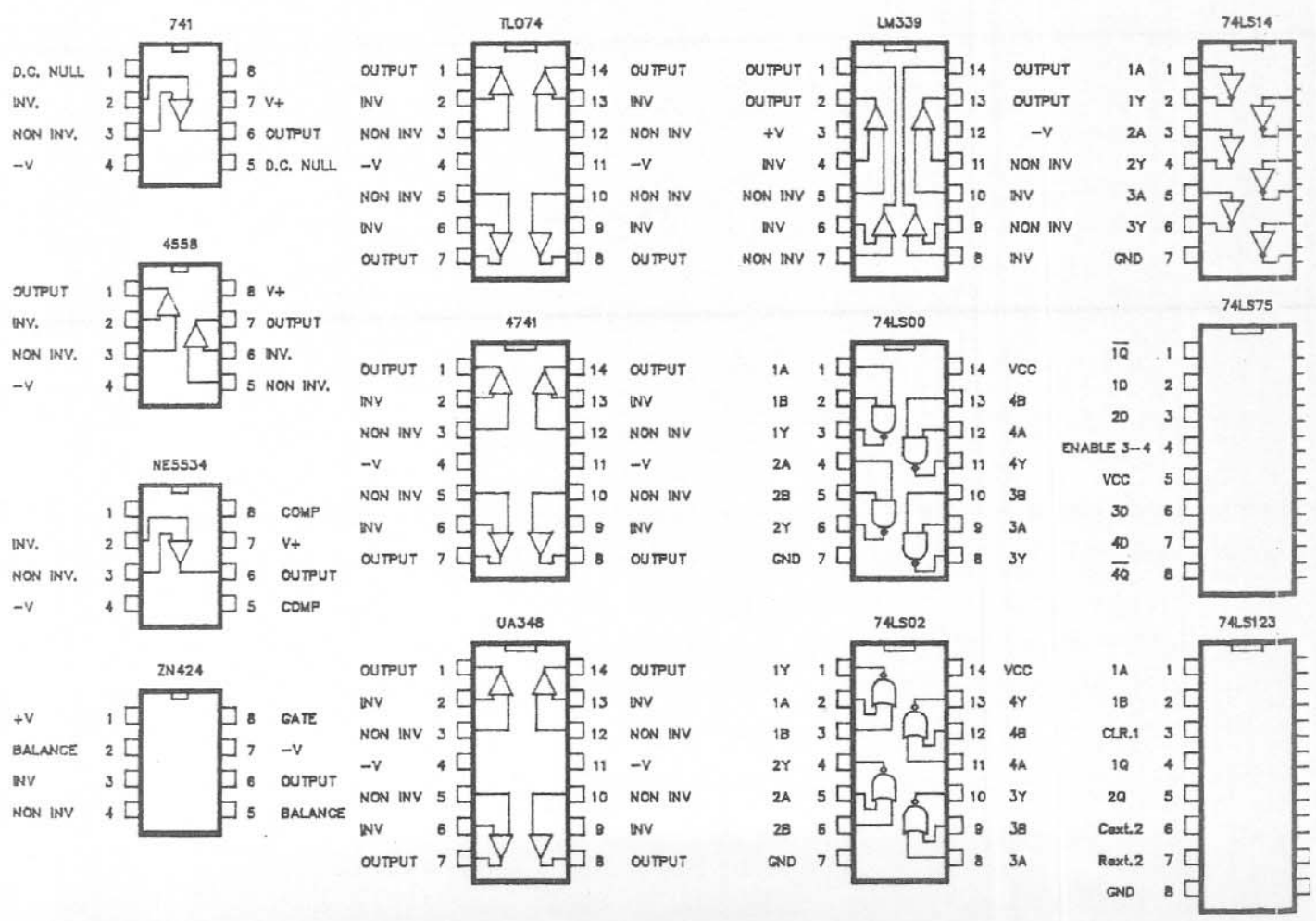
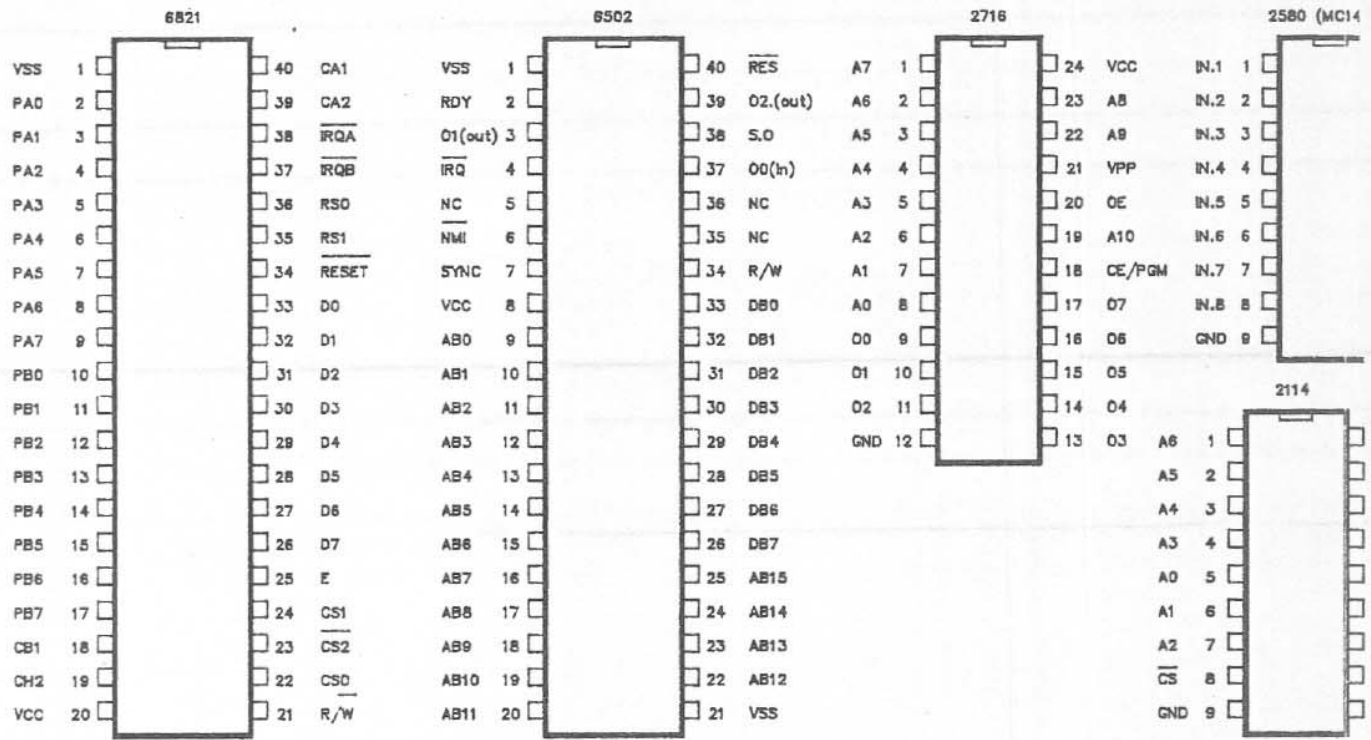
DN60 PSU/INTERFACE S

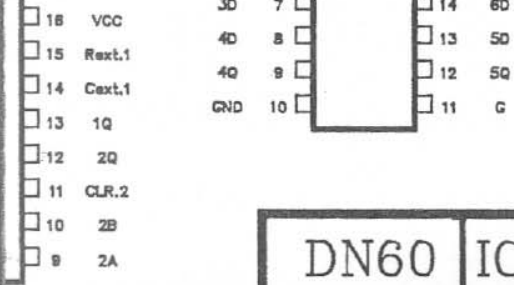
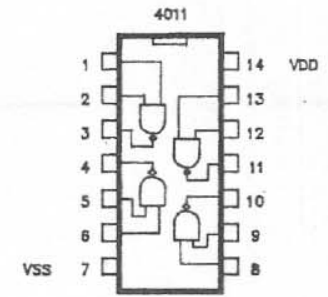
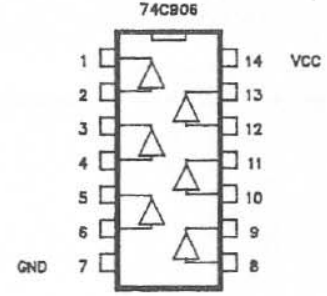
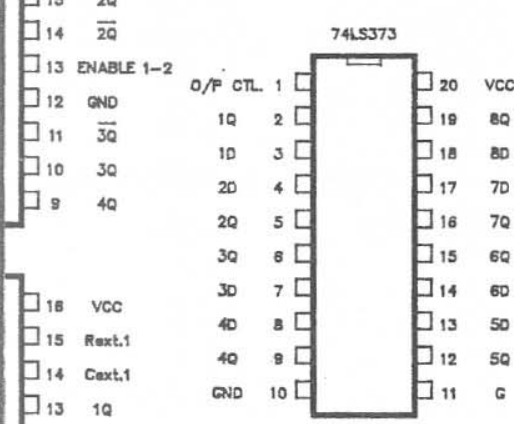
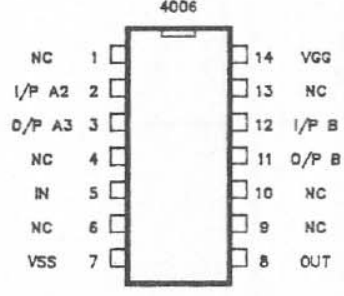
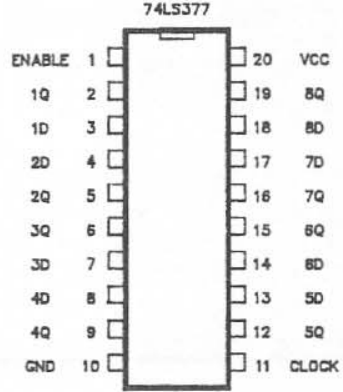
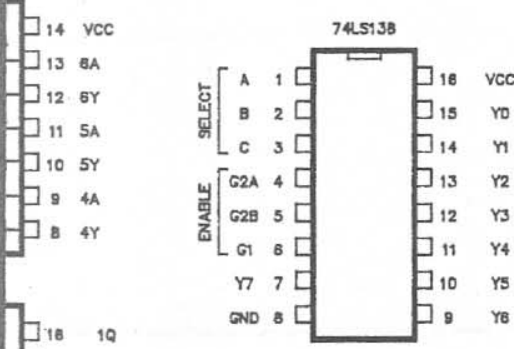
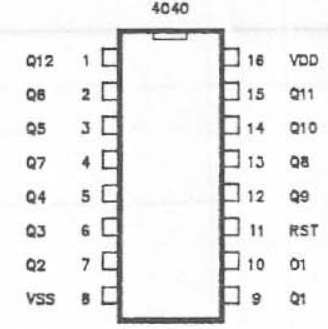
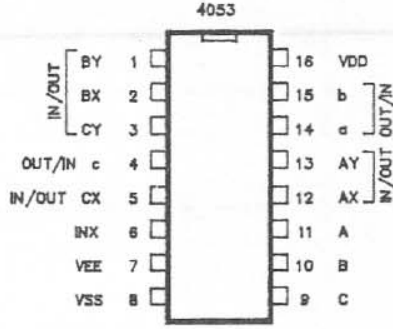
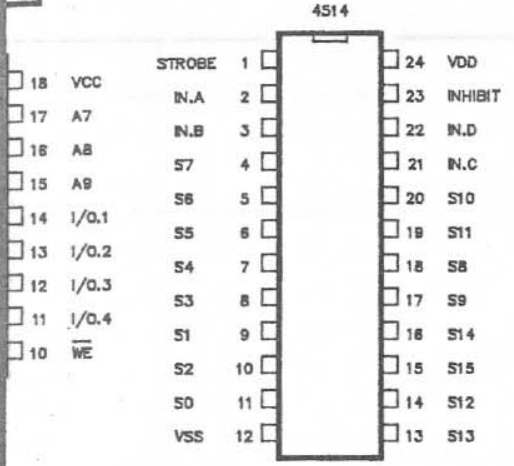
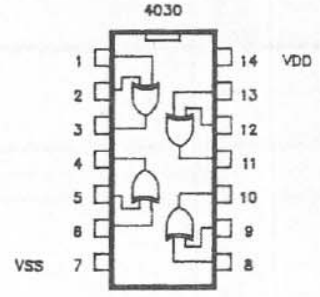
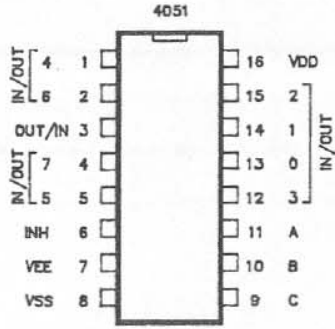
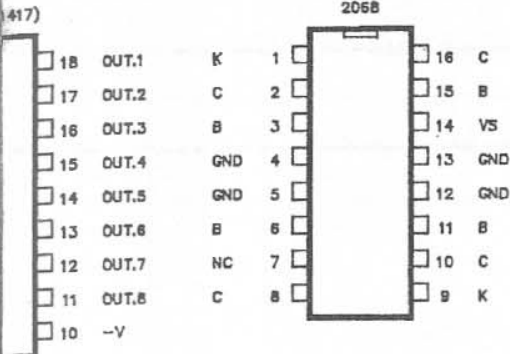
ICI BOARD No.2557

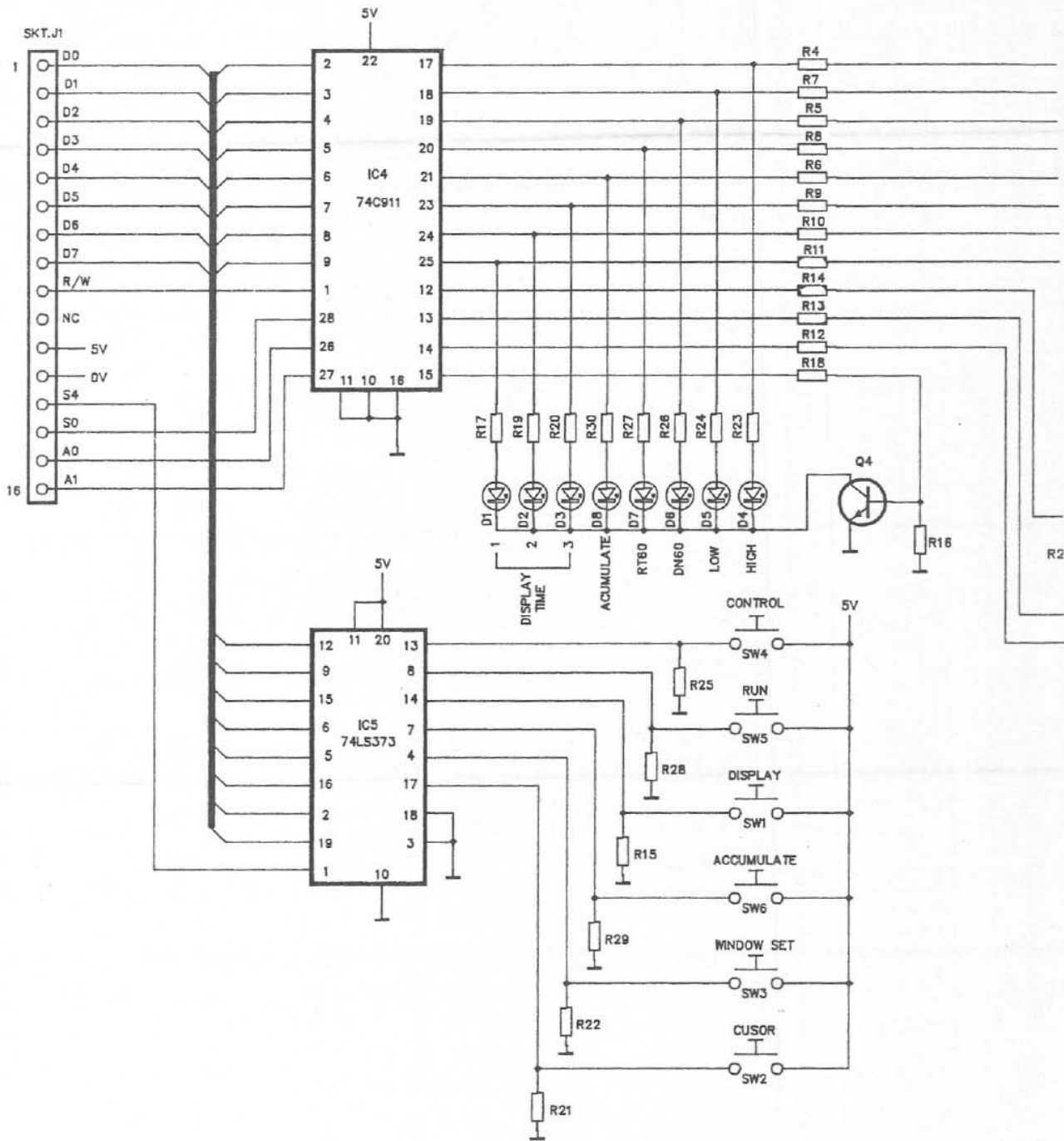


PSU BOARD No.2621









RT60

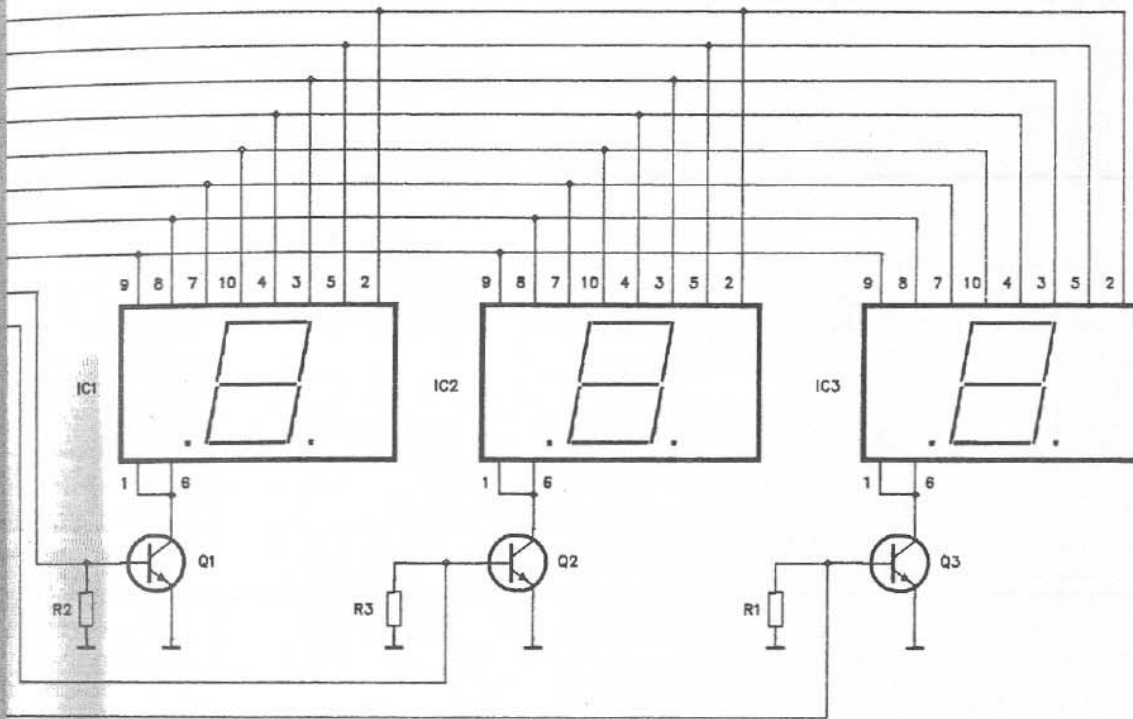
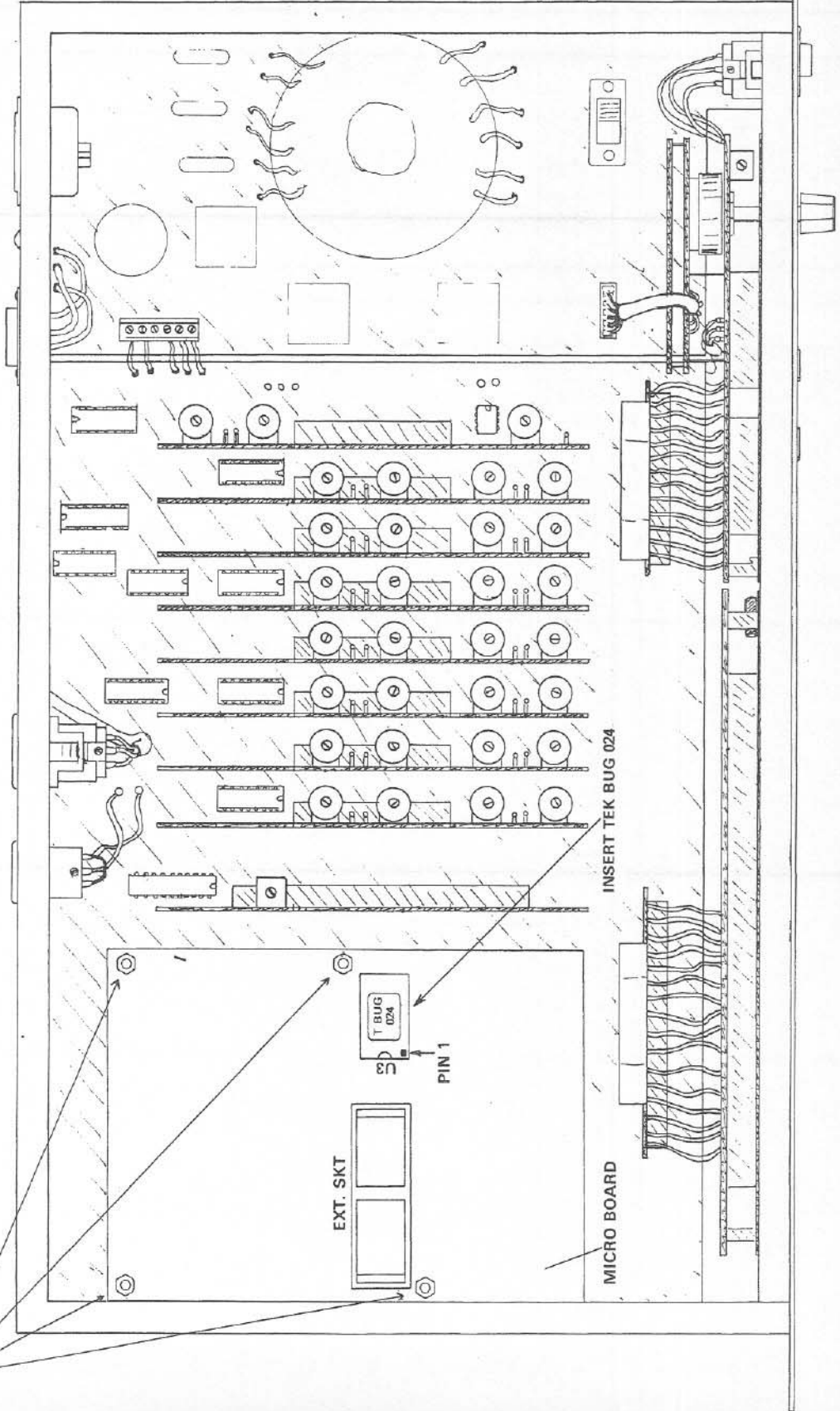


Figure 3

REMOVE M3 NUTS



INSERT TEK BUG 024

MICRO BOARD

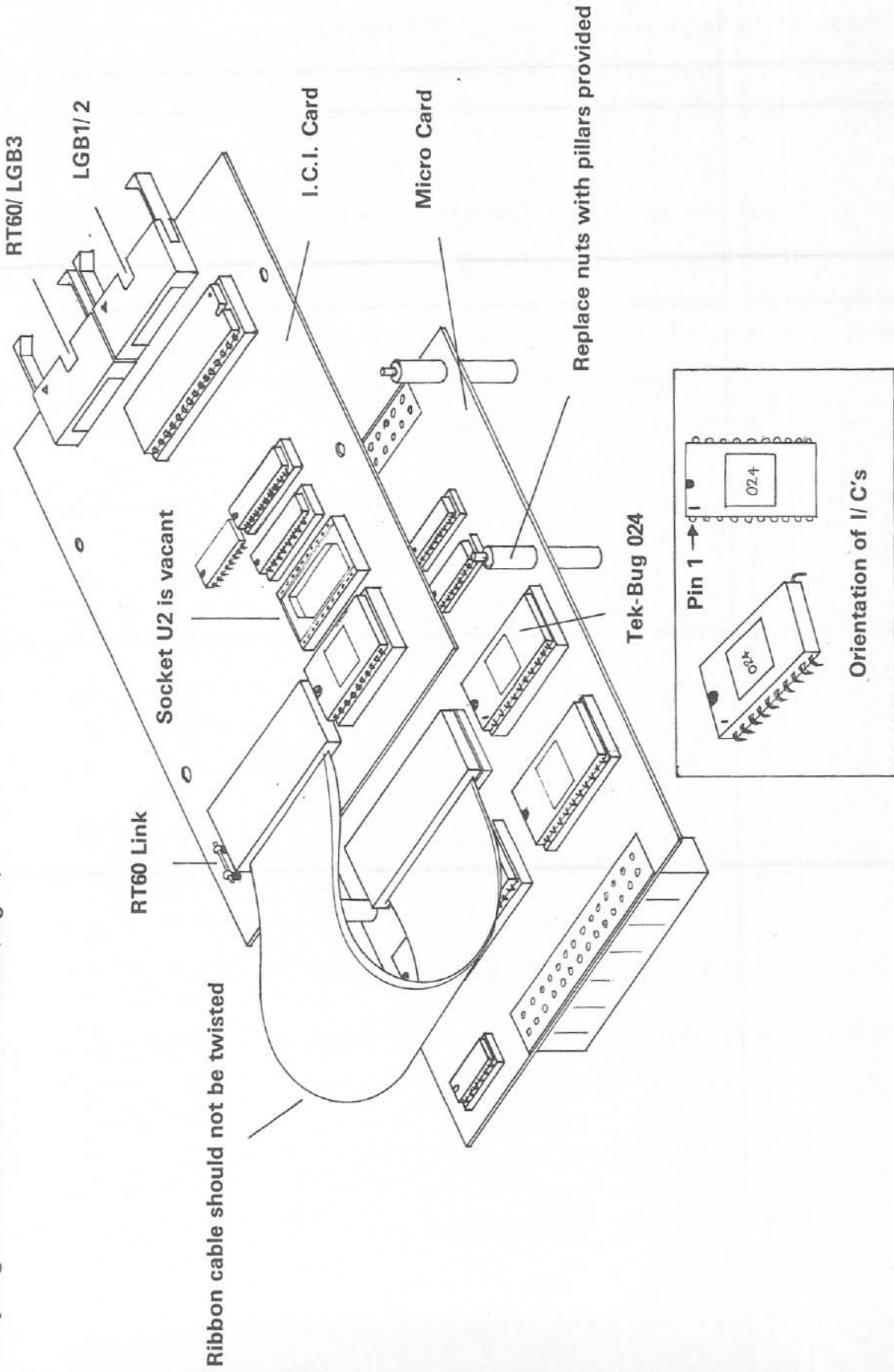
EXT. SKT

PIN 1

T BUG 024

Figure 4

Coupling of Micro and I.C.I. Cards (Fig. 4)



DN60 INTERFACE

The Right Socket is only for connection to the RT - 60
All other external devices are connected via the Left
socket (called the External socket).

The External socket continuously 'sends' a digital
code corresponding to the DN60 display...

NOTE. This data is output only, there is no facility
for data or control input to the DN60.

The LGB 1 contains all the circuitry to enable the
display to be monitored on an Oscilloscope (or any
X-Y) screen, or to be printed out on an X-Y recorder
(plotter).

The enclosed timing diagram and connector details will
be necessary if the user wishes to connect the DN60 to
any other external device (e.g. Computer).

DN60 External Socket Connections

<u>Pin No</u>	<u>Code Name</u>	<u>Description</u>
1	PB7	Not Used
2	PB6	Not Used
3	PB5	Strobe
4	PB4	Data 4
5	PB3	Data 3
6	PB2	Data 2
7	PB1	Data 1
8	PB0	Data 0
9	CB2	Trig.
10	PA0	No Connection
11	CA2	Not Used
12	CA1	Not Used
13	PA1	Connect to 0V.
14	CB1	Not Used
15	0V.	
16	+ 5V.	

A five bit digital word of information is sent out on
Data lines D0 through to D4, every 500 microseconds.
This 5 bit word is the level of a single column on the
DN60 display, represented as 32 x 1 dB steps.

00000 = less than -31 dB.

11111 = 0 dB.

The sequence is started with a pulse on the Trig.
line. This is followed by the 31 columns on the
display, starting with 25Hz. and finishing with
overall level.

Figure 5

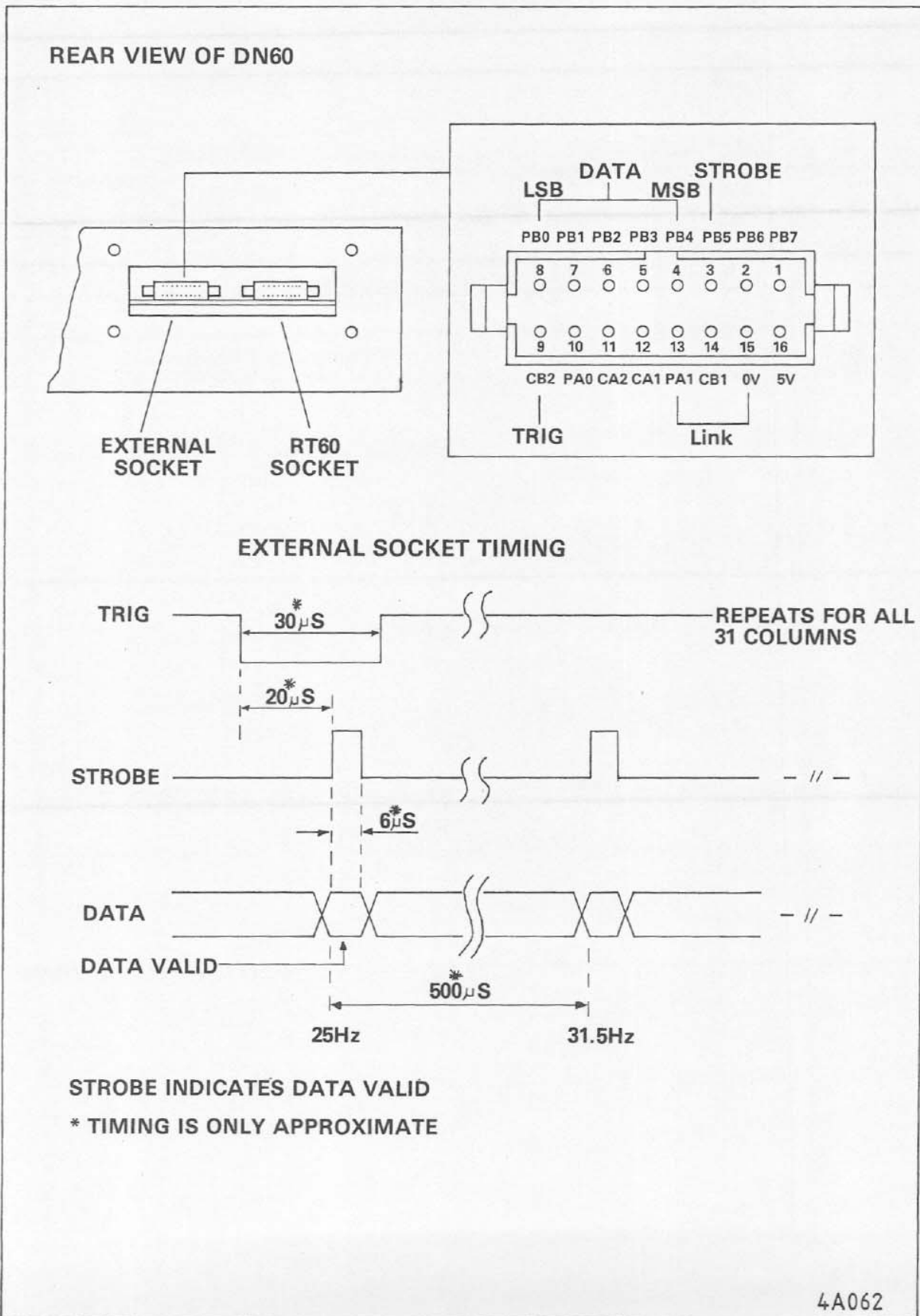
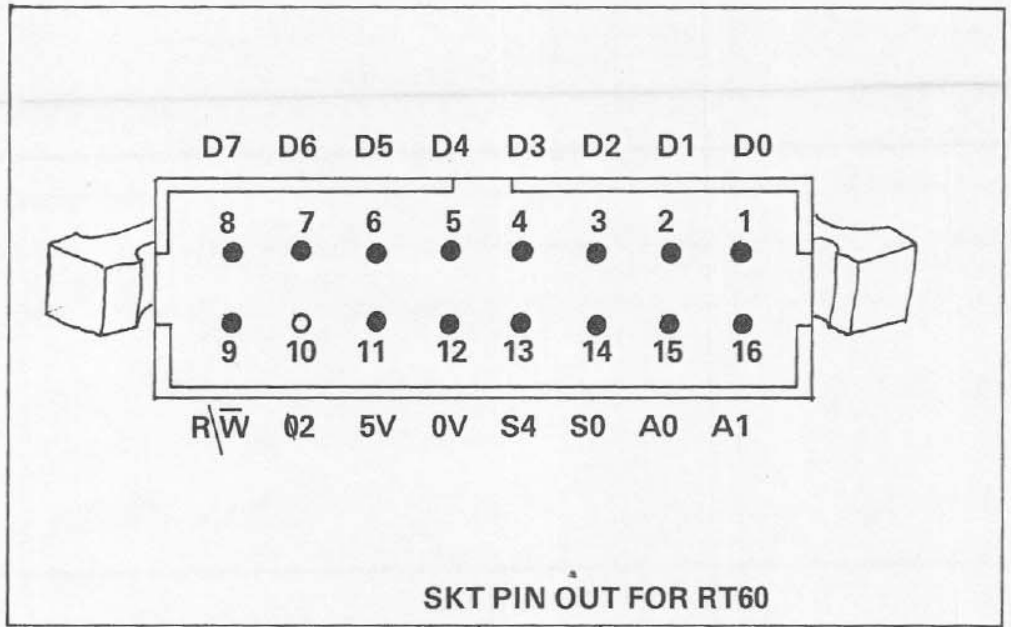
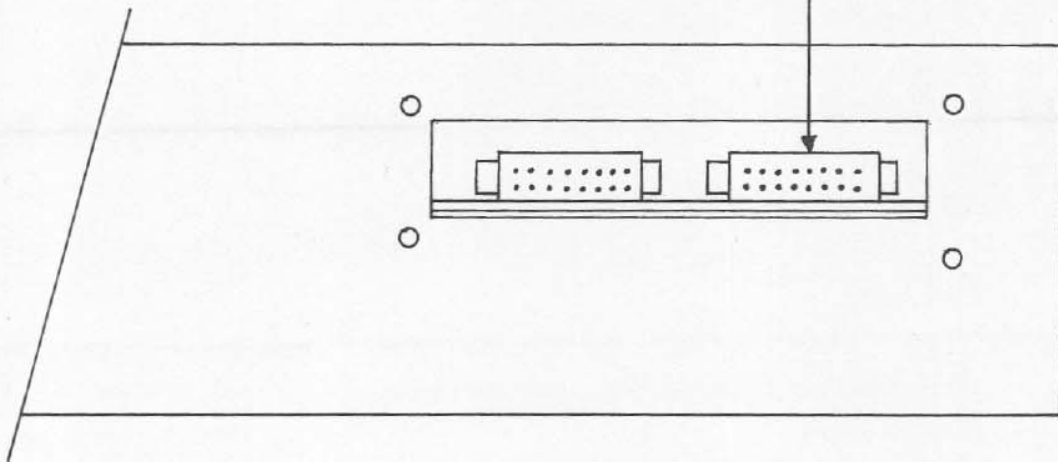


Figure 6



SKT PIN OUT FOR RT60



REAR VIEW OF DN60
WITH ICI CARD FITTED

Figure 7a

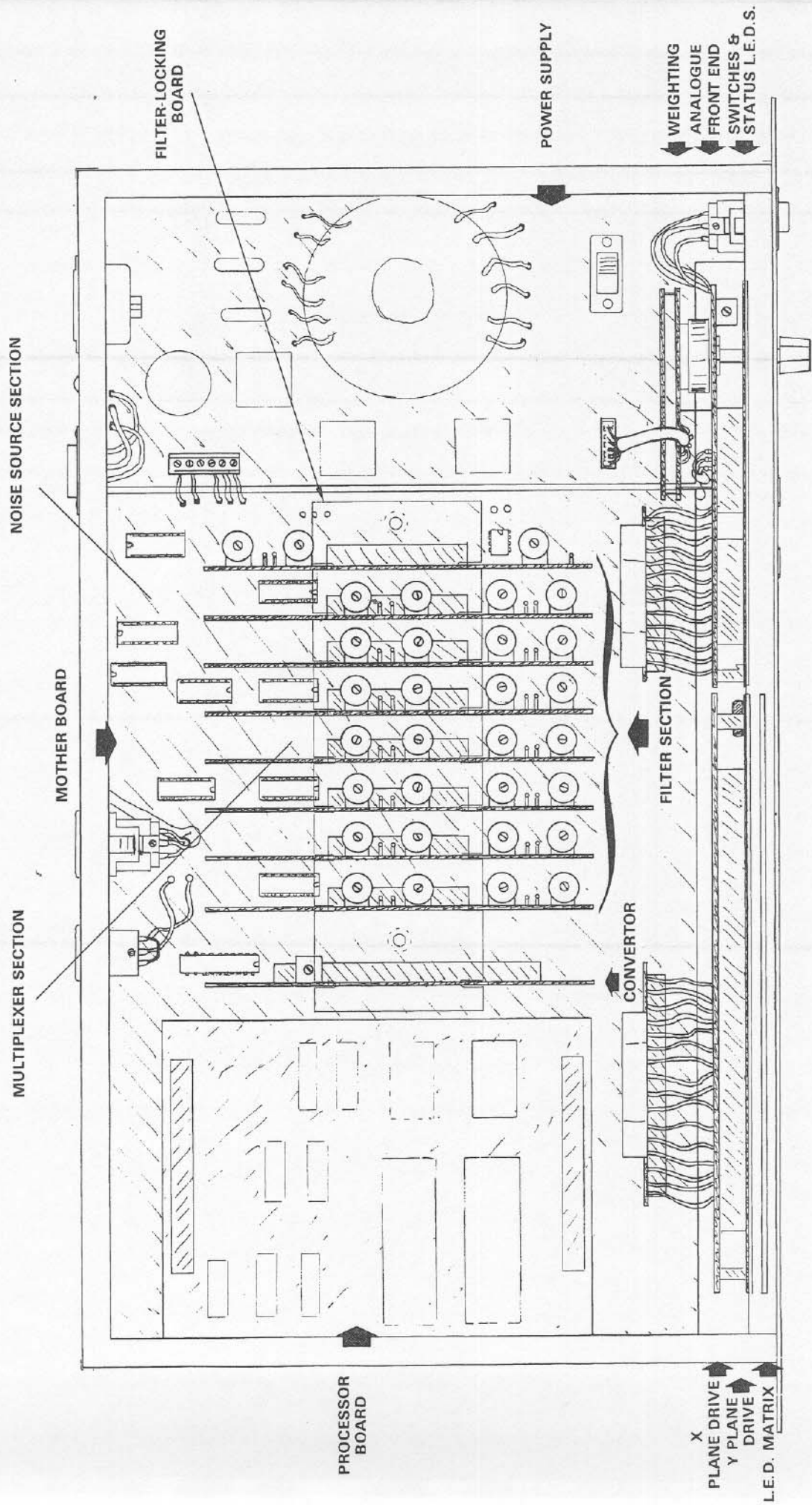
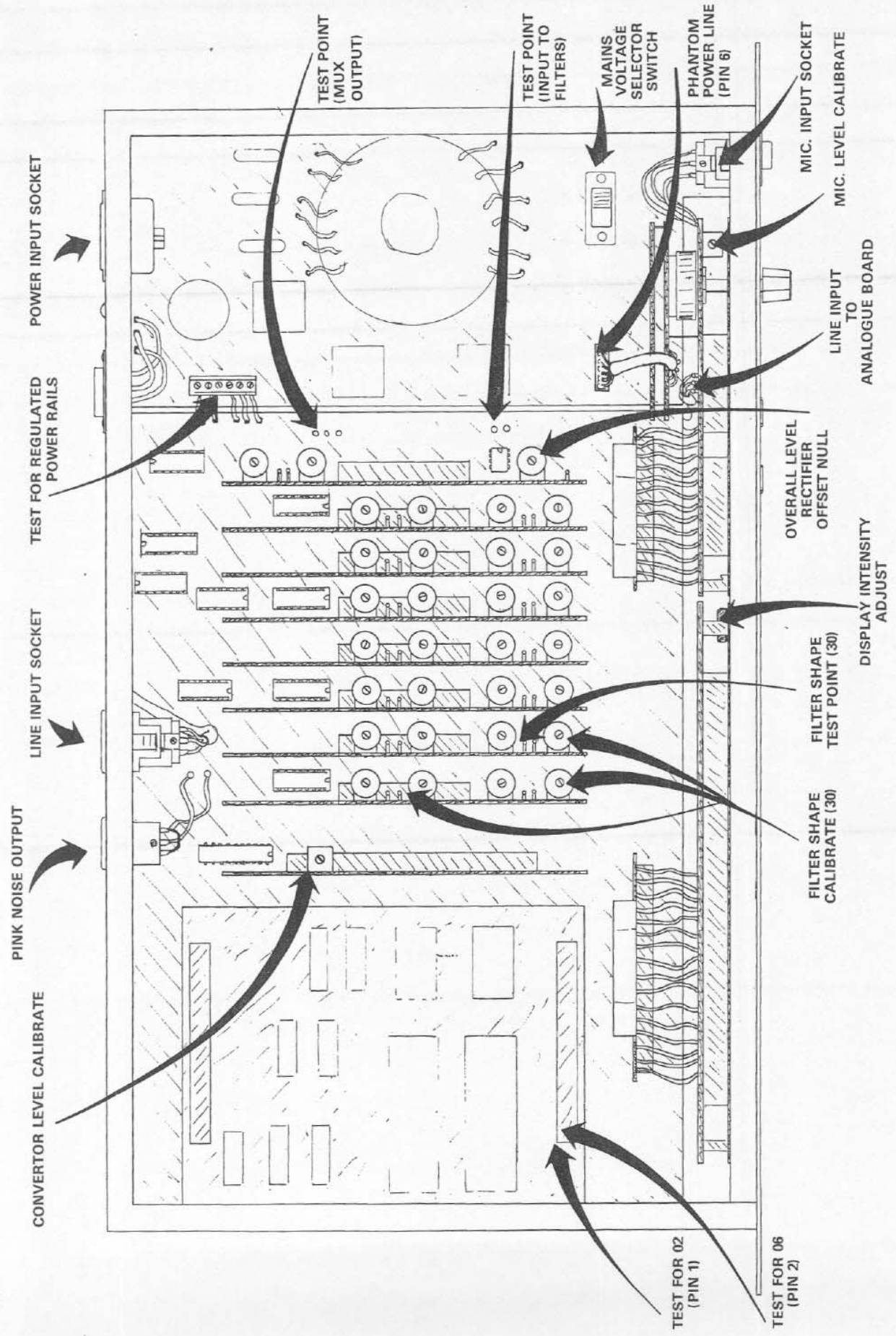


Figure 7b



DN 60 PARTS LIST

Printed on 05.FEB.87

DN 60 POWER SUPPLY ASSEMBLY

REF	ITEM	VALUE	QTY	KTR:NO
B1	BRIDGE DIODE	BR 34	1	D1-AP005
C1	CAP ELECTROLYTIC AXL	470/25V	1	B4-EC347
C2	CAP ELECTROLYTIC AXL	470/25V	1	B4-EC347
C4	CAP ELECTROLYTIC AXL	470/25V	1	B4-EC347
C6	CAP ELECTROLYTIC RAD	6800/16V	1	B4-DB468
C7	CAPACITOR CERAMIC	47N	1	B2-2A047
C8	CAPACITOR CERAMIC	47N	1	B2-2A047
D1	DIODE	1N4002	1	D1-A4002
D2	DIODE	1N4002	1	D1-A4002
D3	DIODE	1N4002	1	D1-A4002
D4	DIODE	1N4002	1	D1-A4002
D5	DIODE	1N4002	1	D1-A4002
D6	DIODE	1N4002	1	D1-A4002
D7	DIODE	1N4002	1	D1-A4002
D8	DIODE	1N4002	1	D1-A4002
D9	DIODE	1N4002	1	D1-A4002
F2	FUSE HOLDER	OPEN PCB MOUNT	1	E3-A0100
F3	FUSE HOLDER	OPEN PCB MOUNT	1	E3-A0100
F4	FUSE HOLDER	OPEN PCB MOUNT	1	E3-A0100
FF2	FUSE	250mA TIME DELAY	1	E3-BA250
FF3	FUSE	250mA TIME DELAY	1	E3-BA250
FF4	FUSE	3A TIME DELAY	1	E3-BQ003
H1	HEATSINK	TV5	2	E8-HOTV5
H2	HEATSINK	TV4	1	E8-HOTV4
K1	RECTANGULAR CAP	SMALL RED	1	E4-B2003
L1	ZERO OHM LINK	ZERO OHM LINK	2	A3-A0001
PC1	PCB 2621	DN60 PSU	1	E6-02621
PP1	LARGE VERO PIN	LARGE VERO PIN	4	E2-N0002
R1	5% RESISTOR	33R	1	A1-10033
ST1	MOLEX 6WAY CONN BLOK	6WAY PCB MOUNT BLOCK	1	E2-BS06B
ST2	MOLEX 6 PIN	0.1 X 6PIN SET LATCH	1	E2-BP061
SW1	LATCHING PUSH SWITCH	ALPS MAINS TYPE	1	E1-BF211
SW2	SLIDE SWITCH	2P2W PCB TERM	1	E1-CB221
T1	MAINS TRANSFORMER	TORODIAL DN60	1	E5-TM005
U1	REGULATOR 8V	78M08 TO220	1	D2-78M08
U2	REGULATOR 8V	78M08 TO220	1	D2-78M08
ZA1	SCREW	M4 X 12 P/HD C+P	1	F1-GC122
ZA2	SCREW	M3 X 10 P/HD C+P	3	F1-GB102
ZB1	SHAKEPROOF WASHER	M4 BZP	1	F1-DC042
ZB2	SHAKEPROOF WASHER	M3 BZP	3	F1-DB032
ZC1	NUTS	M3 BZP	3	F1-AB002
ZF1	TYRAPS	SMALL TYRAPS	2	H1-CA001
ZS1	RUBBER SLEEVES	H30 X 25MM	2	H1-AA002

DN 60 MOTHER BOARD

C1	CAP POLYSTYRENE 2.5%	180PF	1	B3-10180
C2	CAPACITOR POLYESTER	1MFD 5%	1	B1-21000
C3	CAPACITOR POLYESTER	.27MFD 5%	1	B1-20270
C4	CAPACITOR POLYESTER	47N 5%	1	B1-20047
C4A	CAPACITOR POLYESTER	47N 5%	1	B1-20047
C5	CAPACITOR POLYESTER	33N 5%	1	B1-20033

DN 60 MOTHER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
C6	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C7	CAPACITOR POLYESTER	6N8 5%	1	B1-16800
C8	CAPACITOR CERAMIC	8P2	1	B2-10008
C9	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C10	CAPACITOR POLYESTER	3N3 5%	1	B1-13300
CC1	CAPACITOR CERAMIC	47N	4	B2-2A047
CC2	CAPACITOR CERAMIC	82PF	1	B2-10082
CC3	CAPACITOR CERAMIC	82PF	1	B2-10082
D2	DIODE	1N4148	1	D1-A4148
L1	PRE CUT WIRE	BLUE 7/0.2 - 60MM	5	G3-BIBEL
PC1	PCB 2553	DN60 MAIN BOARD	1	E6-02553
PPI	SMALL VERO PIN	SMALL VERO PIN	3	E2-N0001
Q1	TRANSISTOR	BC214 OR EQUIL	1	D1-C214C
Q2	TRANSISTOR	BC184 OR EQUIV	1	D1-C184C
R1	5% RESISTOR	10K	1	A1-30010
R2	5% RESISTOR	20K	1	A1-30020
R3	5% RESISTOR	6K8	1	A1-16800
R4	1% RESISTOR	3K	1	A2-10300
R5	5% RESISTOR	910R	1	A1-10910
R6	5% RESISTOR	270R	1	A1-10270
R7	5% RESISTOR	100K	1	A1-30100
R8	5% RESISTOR	1K	1	A1-11000
R9	5% RESISTOR	10K	1	A1-30010
R10	5% RESISTOR	10K	1	A1-30010
R11	5% RESISTOR	1K	1	A1-11000
R12	5% RESISTOR	3K3	1	A1-13300
R13	5% RESISTOR	10K	1	A1-30010
R14	5% RESISTOR	1K	1	A1-11000
R15	5% RESISTOR	1K	1	A1-11000
R16	5% RESISTOR	1K	1	A1-11000
R17	5% RESISTOR	1K	1	A1-11000
R18	5% RESISTOR	1K	1	A1-11000
R19	5% RESISTOR	10K	1	A1-30010
R20	5% RESISTOR	1K	1	A1-11000
R21	5% RESISTOR	1K	1	A1-11000
R22	5% RESISTOR	27K	1	A1-30027
R23	5% RESISTOR	27K	1	A1-30027
R24	5% RESISTOR	10K	1	A1-30010
R25	5% RESISTOR	10K	1	A1-30010
R26	5% RESISTOR	3K9	1	A1-13900
R27	5% RESISTOR	3K9	1	A1-13900
R28	5% RESISTOR	3K9	1	A1-13900
R29	5% RESISTOR	3K9	1	A1-13900
R30	5% RESISTOR	150R	1	A1-10150
ST2	MOLEX 4 PIN	0.2 X 4PIN SET STD	1	E2-BP043
ST2A	MOLEX 6 PIN	0.2 X 6PIN SET STD	2	E2-BP062
ST3	MOLEX 4 PIN	0.2 X 4PIN SET STD	1	E2-BP043
ST3A	MOLEX 6 PIN	0.2 X 6PIN SET STD	2	E2-BP062
ST4	MOLEX 4 PIN	0.2 X 4PIN SET STD	1	E2-BP043
ST4A	MOLEX 6 PIN	0.2 X 6PIN SET STD	2	E2-BP062
ST5	MOLEX 6 PIN	0.2 X 6PIN SET STD	3	E2-BP062
ST6	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST7	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043

DN 60 MOTHER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
ST8	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST9	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST10	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST11	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST12	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST13	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST14	MOLEX 6 PIN	0.2 X 6PIN SET STD	2	E2-BP062
U1	CMOS IC	4030/4070	1	D4-14030
U1S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U2	CMOS IC	4006	1	D4-14006
U2S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U3	CMOS IC	4006	1	D4-14006
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U4	LINEAR IC	ZN424	1	D2-ZN424
U5	CMOS IC	4011	1	D4-14011
U5S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U6	CMOS IC	4011	1	D4-14011
U6S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U7	TTL IC LS	74LS373	1	D3-7A373
U8	CMOS IC	4051	1	D4-14051
U8S	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U9	CMOS IC	4051	1	D4-14051
U9S	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U10	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U10	CMOS IC	4051	1	D4-14051
U11	CMOS IC	4051	1	D4-14051
U11S	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U12	LINEAR IC SINGLE	5534	1	D2-01034
U13	TTL IC LS	74LS75	1	D3-7A075
ZA1	SCREW	M3 X 6 P/HD BZP	4	F1-GB062
ZB1	SHAKEPROOF WASHER	M3 BZP	4	F1-DB032
ZD1	PILLAR 65MM	M3 TAPPED + TAPPED	2	E4-P3C65
ZD2	PILLAR 16MM	M3 THREADED + TAPPED	4	E4-P3B16
ZF1	SMALL RUBBER FEET	SMALL RUBBER FEET	1	H1-F0001

DN 60 MICRO BOARD

C1	CAP POLYSTYRENE 2.5%	470PF	1	B3-10470
C2	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	11	B2-2A047
PC1	PCB 2536	DN60 PROCESSOR	1	E6-02536
R1	5% RESISTOR	4K7	1	A1-14700
R2	5% RESISTOR	3K3	1	A1-13300
R3	5% RESISTOR	5K6	1	A1-15600
R4	5% RESISTOR	5K6	1	A1-15600
R5	5% RESISTOR	750R	1	A1-10750
R6	5% RESISTOR	56K	1	A1-30056
R7	5% RESISTOR	27K	1	A1-30027
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY TOP SOCKET	2	E2-BS08C
ST2	MOLEX 8 WAY SOCKET	0.2X8 WAY TOP SOCKET	2	E2-BS08C
U1	MICROPROCESSOR IC	6502	1	D5-6502M
U1S	40 PIN DIL SOCKET	40 PIN DIL SOCKET	1	E2-ES401
U2	2K X 8 EPROM IC	2716	1	D5-T2716
U2S	24 PIN DIL SOCKET	24 PIN DIL SOCKET	1	E2-ES241

DN 60 MICRO BOARD

-REF-	ITEM	VALUE	QTY	KTR:NO-
U3S	24 PIN DIL SOCKET	24 PIN DIL SOCKET	1	E2-ES241
U4	1K X 4 SRAM IC	2114	1	D5-F2114
U4S	18 PIN DIL SOCKET	18 PIN DIL SOCKET	1	E2-ES181
U5	1K X 4 SRAM IC	2114	1	D5-F2114
U5S	18 PIN DIL SOCKET	18 PIN DIL SOCKET	1	E2-ES181
U6	CMOS IC	4013	1	D4-14013
U6S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U7	TTL IC LS	74LS138	1	D3-7A138
U8	TTL IC LS	74LS138	1	D3-7A138
U9	TTL IC LS	74LS138	1	D3-7A138
U10	TTL IC LS	74LS14	1	D3-7A014
U11	TTL IC LS	74LS02	1	D3-7A002
U12S	40 PIN DIL SOCKET	40 PIN DIL SOCKET	1	E2-ES401

DN 60 DISPLAY BOARD

PC1	PCB 2620	DN60 DISPLAY	1	E6-02620
ST1	MOLEX 4 PIN	0.2 X 4PIN SET STD	8	E2-BP043
ST2	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST3	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
U1	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U2	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U3	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U4	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U5	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U6	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U7	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U8	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U9	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U10	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U11	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U12	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U13	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U14	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U15	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U16	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U17	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U18	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U19	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U20	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U21	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U22	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U23	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U24	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U25	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U26	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U27	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U28	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U29	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U30	RED LED 4*0.1 PCB	LD 464	4	D1-AL464
U31	RED LED 4*0.1 PCB	LD 464	4	D1-AL464

DN 60 X PLANE BOARD

-REF-	ITEM	VALUE	QTY	KTR:NO-
L1	PRE CUT WIRE	BLUE 7/0.2 - 60MM	16	G3-BIBEL
PC1	PCB 2530	DN60 X PLANE	1	E6-02530
PC2	PCB 2538	DN60 DISPLAY LINK	1	E6-02538
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY TOP SOCKET	2	E2-BS08C
ST2	MOLEX 8 WAY SOCKET	0.2X8 WAY TOP SOCKET	4	E2-BS08C
ST3	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	2	E2-BS08A
U1	CMOS IC	4514	1	D4-14514
U1S	24 PIN DIL SOCKET	24 PIN DIL SOCKET	1	E2-ES241
U2	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U3	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U4	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U5	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U6	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U7	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U8	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U9	CURRENT SINK QUAD	ULN 2068	1	D2-02068
U10	CMOS IC	4514	1	D4-14514
U10S	24 PIN DIL SOCKET	24 PIN DIL SOCKET	1	E2-ES241

DN 60 Y PLANE BOARD

C1	CAPACITOR CERAMIC	47N	1	B2-2A047
C2	CAPACITOR CERAMIC	47N	1	B2-2A047
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
PC1	PCB 2529	DN60 Y PLANE	1	E6-02529
R1	5% RESISTOR	10K	1	A1-30010
R2	5% RESISTOR	10K	1	A1-30010
R3	5% RESISTOR	10K	1	A1-30010
R4	5% RESISTOR	10K	1	A1-30010
R5	5% RESISTOR	10K	1	A1-30010
R6	5% RESISTOR	10K	1	A1-30010
R7	5% RESISTOR	10K	1	A1-30010
R8	5% RESISTOR	10K	1	A1-30010
R9	5% RESISTOR	10R	1	A1-10010
R10	5% RESISTOR	10R	1	A1-10010
R11	5% RESISTOR	10R	1	A1-10010
R12	5% RESISTOR	10R	1	A1-10010
R13	5% RESISTOR	10R	1	A1-10010
R14	5% RESISTOR	10R	1	A1-10010
R15	5% RESISTOR	10R	1	A1-10010
R16	5% RESISTOR	10R	1	A1-10010
R17	5% RESISTOR	10K	1	A1-30010
R18	5% RESISTOR	10K	1	A1-30010
R19	5% RESISTOR	10K	1	A1-30010
R20	5% RESISTOR	10K	1	A1-30010
R21	5% RESISTOR	10K	1	A1-30010
R22	5% RESISTOR	10K	1	A1-30010
R23	5% RESISTOR	10K	1	A1-30010
R24	5% RESISTOR	10K	1	A1-30010
R25	5% RESISTOR	10R	1	A1-10010
R26	5% RESISTOR	10R	1	A1-10010
R27	5% RESISTOR	10R	1	A1-10010
R28	5% RESISTOR	10R	1	A1-10010
R29	5% RESISTOR	10R	1	A1-10010

DN 60 Y PLANE BOARD

REF	ITEM	VALUE	QTY	KTR:NO
R30	5% RESISTOR	10R	1	A1-10010
R31	5% RESISTOR	10R	1	A1-10010
R32	5% RESISTOR	10R	1	A1-10010
R33	5% RESISTOR	10K	1	A1-30010
R35	5% RESISTOR	39K	1	A1-30039
RL1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
ST1	MOLEX 4 PIN	0.2 X 4PIN SET STD	4	E2-BP043
ST2	MOLEX 8 WAY SOCKET	0.2X8WAY BOTT SOCKET	1	E2-BS08B
ST3	MOLEX 8 WAY SOCKET	0.2X8WAY BOTT SOCKET	1	E2-BS08B
U1	CURRENT SOURCE QUAD	1417/2580	1	D2-02580
U2	TTL IC LS	74LS373	1	D3-7A373
U3	TTL IC LS	74LS373	1	D3-7A373
U4	CURRENT SOURCE QUAD	1417/2580	1	D2-02580
U5	TTL IC LS	74LS123	1	D3-7A123
VR34	PIHER HOZ PRESET	10K	1	A3-F2010

DN 60 ANALOGUE

C1	CAP ELECTROLYTIC RAD	47/16V	1	B4-DB247
C2	CAP ELECTROLYTIC RAD	47/16V	1	B4-DB247
C3	CAP ELECTROLYTIC RAD	100/16V	1	B4-DB310
C4	CAPACITOR CERAMIC	47P	1	B2-10047
C5	CAP POLYSTRENE 2.5%	120PF	1	B3-10120
C6	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C7	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C8	CAP POLYSTYRENE 2.5%	100PF	1	B3-10100
C9	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C10	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C11	CAP POLYSTYRENE 2.5%	470PF	1	B3-10470
CC1	CAP ELECTROLYTIC RAD	47/16V	2	B4-DB247
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D3	DIODE	1N4148	1	D1-A4148
D4	DIODE	1N4148	1	D1-A4148
L1	PRE CUT WIRE	BLUE 7/0.2 - 60MM	12	G3-BIBE1
PC1	PCB 2533	DN60 ANALOGUE	1	E6-02533
PC2	PCB 2539	DN60 SWITCH LINK	1	E6-02539
PP1	SMALL VERO PIN	SMALL VERO PIN	6	E2-N0001
R1	5% RESISTOR	2K2	1	A1-12200
R2	5% RESISTOR	2K2	1	A1-12200
R3	5% RESISTOR	3K9	1	A1-13900
R4	5% RESISTOR	3K9	1	A1-13900
R5	5% RESISTOR	47K	1	A1-30047
R6	5% RESISTOR	47K	1	A1-30047
R7	5% RESISTOR	680R	1	A1-10680
R8	5% RESISTOR	910R	1	A1-10910
R10	5% RESISTOR	2K2	1	A1-12200
R11	5% RESISTOR	47K	1	A1-30047
R12	5% RESISTOR	1K	1	A1-11000
R13	5% RESISTOR	47K	1	A1-30047
R14	5% RESISTOR	1K	1	A1-11000
R15	5% RESISTOR	8K2	1	A1-18200
R16	5% RESISTOR	8K2	1	A1-18200
R17	5% RESISTOR	1K	1	A1-11000

DN 60 ANALOGUE

REF	ITEM	VALUE	QTY	KTR:NO
R18	5% RESISTOR	2K7	1	A1-12700
R19	5% RESISTOR	47K	1	A1-30047
R20	5% RESISTOR	20K	1	A1-30020
R21	5% RESISTOR	10K	1	A1-30010
R22	1% RESISTOR	10K	1	A2-11000
R23	1% RESISTOR	10K	1	A2-11000
R24	5% RESISTOR	6K8	1	A1-16800
R25	5% RESISTOR	220R	1	A1-10220
R26	5% RESISTOR	1K	1	A1-11000
R27	5% RESISTOR	1K	1	A1-11000
R28	5% RESISTOR	1K	1	A1-11000
R29	5% RESISTOR	1K	1	A1-11000
R30	5% RESISTOR	1K	1	A1-11000
R31	5% RESISTOR	220K	1	A1-30220
ST1	MOLEX 6 WAY SOCKET	0.2X6 WAY RIGHT SKT	2	E2-BS06A
ST2	MOLEX 8 WAY SOCKET	0.2X8 WAY TOP SOCKET	1	E2-BS08C
ST3	MOLEX 8 WAY SOCKET	0.2X8 WAY TOP SOCKET	1	E2-BS08C
ST4	MOLEX 8 WAY SOCKET	0.2X8 WAY TOP SOCKET	1	E2-BS08C
U1	LINEAR IC SINGLE	5534	1	D2-01034
U1S	8 PIN DIL SOCKET	8 PIN DIL SOCKET	1	E2-ES082
U2	LINEAR IC QUAD	4741	1	D2-04741
U2S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U3	CMOS IC	4053	1	D4-14053
U3S	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U4	TTL IC LS	74LS373	1	D3-7A373
U5	TTL IC LS	74LS373	1	D3-7A373
U6	TTL IC LS	74LS373	1	D3-7A373
VR9	72XW TYPE PRESET	72XW 5K	1	A3-D2005

DN 60 A/D CONVERTER BOARD

C1	CAPACITOR CERAMIC	47N	1	B2-2A047
C2	CAPACITOR CERAMIC	330PF	1	B2-10330
CC1	CAPACITOR CERAMIC	47N	4	B2-2A047
PC1	PCB 2568	DN60 A/D	1	E6-02568
R1	5% RESISTOR	2K2	1	A1-12200
R2	5% RESISTOR	10K	1	A1-30010
R3	5% RESISTOR	5K1	1	A1-15100
R4	5% RESISTOR	1K	1	A1-11000
R5	5% RESISTOR	10K	1	A1-30010
R6	5% RESISTOR	10K	1	A1-30010
R7	5% RESISTOR	3K9	1	A1-13900
R8	5% RESISTOR	4K7	1	A1-14700
R10	5% RESISTOR	390R	1	A1-10390
R11	1% RESISTOR	6K04	1	A2-10604
R12	1% RESISTOR	2K4	1	A2-10240
R13	1% RESISTOR	953R	1	A2-09530
R14	1% RESISTOR	442R	1	A2-04420
R15	1% RESISTOR	191R	1	A2-01910
R16	1% RESISTOR	536R	1	A2-05360
R17	1% RESISTOR	475R	1	A2-04750
R18	1% RESISTOR	422R	1	A2-04220
R19	1% RESISTOR	374R	1	A2-03740
R20	1% RESISTOR	340R	1	A2-03400

DN 60 A/D CONVERTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
R21	1% RESISTOR	301R	1	A2-03010
R22	1% RESISTOR	267R	1	A2-02670
R23	1% RESISTOR	2K2	1	A2-10220
R24	5% RESISTOR	3K6	1	A1-13600
R25	5% RESISTOR	4K7	1	A1-14700
R26	5% RESISTOR	1K5	1	A1-11500
R27	5% RESISTOR	1K	1	A1-11000
R29	5% RESISTOR	1K	1	A1-11000
R30	5% RESISTOR	1K	1	A1-11000
R31	5% RESISTOR	1K	1	A1-11000
R32	5% RESISTOR	1K	1	A1-11000
R33	5% RESISTOR	1K	1	A1-11000
R34	5% RESISTOR	1K	1	A1-11000
R35	5% RESISTOR	10K	1	A1-30010
ST1	MOLEX 6 WAY SOCKET	0.2X6 WAY RIGHT SKT	1	E2-BS06A
ST2	MOLEX 6 WAY SOCKET	0.2X6 WAY RIGHT SKT	1	E2-BS06A
ST3	MOLEX 6 WAY SOCKET	0.2X6 WAY RIGHT SKT	1	E2-BS06A
U1	COMPARITOR IC QUAD	LM339	1	D2-LM339
U2	LINEAR IC SINGLE	4558	1	D2-04558
U2S	8 PIN DIL SOCKET	8 PIN DIL SOCKET	1	E2-ES082
U3	CMOS IC	4053	1	D4-14053
U3S	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U4	CMOS IC	4051	1	D4-14051
U4S	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U5	CMOS IC	4040	1	D4-14040
U5S	16 PIN DIL SOCKET	16 PIN DIL SOCKET	1	E2-ES161
U6	CMOS IC	4013	1	D4-14013
U6S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U7	TTL IC LS	74LS373	1	D3-7A373
U8	TTL IC LS	74LS377	1	D3-7A377
U9	CMOS IC	74C906	1	D4-4C906
U9S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR9	72XW TYPE PRESET	72XW 5K	1	A3-D2005
Z1	ZENNER DIODE	5V1 400mW	1	D1-A05V1

DN 60 A WEIGHTING

C1	CAPACITOR POLYESTER	.22MFD 5%	1	B1-20220
C2	CAPACITOR POLYESTER	12N 5%	1	B1-20012
C3	CAPACITOR POLYESTER	1N5 5%	1	B1-11500
C4	CAPACITOR POLYESTER	.22MFD 5%	1	B1-20220
C5	CAPACITOR POLYESTER	8N2 5%	1	B1-18200
C6	CAPACITOR POLYESTER	6N8 5%	1	B1-16800
PC1	PCB 2537	DN60 A WEIGHTING	1	E6-02537
R1	5% RESISTOR	15K	1	A1-30015
R2	5% RESISTOR	18K	1	A1-30018
R3	5% RESISTOR	7K5	1	A1-17500
R4	1% RESISTOR	10K2	1	A2-11020
R5	1% RESISTOR	4K70	1	A2-10470
R6	5% RESISTOR	7K5	1	A1-17500
R7	5% RESISTOR	2K	1	A1-12000
R8	1% RESISTOR	49R9	1	A2-00499
R9	1% RESISTOR	110R	1	A2-01100
R10	1% RESISTOR	348R	1	A2-03480

DN 60 A WEIGHTING

REF	ITEM	VALUE	QTY	KTR:NO
R11	1% RESISTOR	1K18	1	A2-10118
R12	1% RESISTOR	3K32	1	A2-10332
R13	1% RESISTOR	3K32	1	A2-10332
R14	1% RESISTOR	1K18	1	A2-10118
R15	1% RESISTOR	348R	1	A2-03480
R16	1% RESISTOR	160R	1	A2-01600
RB1	5% RESISTOR	47K	1	A1-30047
RL1	5% RESISTOR	33R	1	A1-10033
RL2	5% RESISTOR	33R	1	A1-10033
S1	ROTARY SWITCH	1P 12W STD PCB	1	E1-DB112
ST2	MOLEX 6WAY SKT IDC	0.1 *6 IDC SOCKET	1	E2-CS063
U1	LINEAR IC SINGLE	741	1	D2-00741
U1S	8 PIN DIL SOCKET	8 PIN DIL SOCKET	1	E2-ES082

DN 60 16 KHZ FILTER BOARD

C1	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C2	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C3	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C4	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C5	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C11	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C12	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C13	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C14	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C15	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAPACITOR POLYESTER	47N 5%	1	B1-20047
C22	CAPACITOR POLYESTER	47N 5%	1	B1-20047
C23	CAP POLYSTYRENE 2.5%	560PF-	1	B3-10560
C24	CAP POLYSTYRENE 2.5%	1N2	1	B3-11200
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C27	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C28	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D23	DIODE	1N4148	1	D1-A4148
D24	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	4	A3-A0001
PC1	PCB 2622	DN60 O/L + FILTER	1	E6-02622
PP1	SMALL VERO PIN	SMALL VERO PIN	3	E2-N0001
R1	1% RESISTOR	10K7	1	A2-11070
R2	1% RESISTOR	267R	1	A2-02670
R2A	5% RESISTOR	68R	1	A1-10068
R3	1% RESISTOR	115K	1	A2-20115
R4	1% RESISTOR	12K4	1	A2-11240
R5	1% RESISTOR	332R	1	A2-03320
R5A	5% RESISTOR	68R	1	A1-10068

DN 60 16 KHZ FILTER BOARD

-REF-	ITEM	VALUE	QTY	KTR:NO-
R6	1% RESISTOR	130K	1	A2-20130
R7	1% RESISTOR	34K8	1	A2-13480
R8	1% RESISTOR	39K	1	A2-13900
R9	5% RESISTOR	100K	1	A1-30100
R10	5% RESISTOR	1K8	1	A1-11800
R11	1% RESISTOR	8K66	1	A2-10866
R12	1% RESISTOR	240R	1	A2-02400
R12A	5% RESISTOR	68R	1	A1-10068
R13	1% RESISTOR	80K6	1	A2-18060
R14	1% RESISTOR	8K87	1	A2-10887
R15	1% RESISTOR	267R	1	A2-02670
R15A	5% RESISTOR	68R	1	A1-10068
R16	1% RESISTOR	102K	1	A2-20102
R17	1% RESISTOR	34K8	1	A2-13480
R18	1% RESISTOR	39K	1	A2-13900
R19	5% RESISTOR	100K	1	A1-30100
R20	5% RESISTOR	1K8	1	A1-11800
R21	5% RESISTOR	100K	1	A1-30100
R22	5% RESISTOR	47K	1	A1-30047
R23	5% RESISTOR	82K	1	A1-30082
R24	5% RESISTOR	390K	1	A1-30390
R25	5% RESISTOR	180K	1	A1-30180
R26	5% RESISTOR	8K2	1	A1-18200
R27	5% RESISTOR	8K2	1	A1-18200
R28	1% RESISTOR	45K3	1	A2-14530
R29	1% RESISTOR	39K	1	A2-13900
R30	5% RESISTOR	56K	1	A1-30056
R31	5% RESISTOR	100K	1	A1-30100
R32	5% RESISTOR	270K	1	A1-30270
R33	1% RESISTOR	6K49	1	A2-10649
R34	1% RESISTOR	10K	1	A2-11000
R35	5% RESISTOR	47K	1	A1-30047
R36	5% RESISTOR	47K	1	A1-30047
R37	1% RESISTOR	118K	1	A2-20118
R38	1% RESISTOR	100K	1	A2-20100
R39	5% RESISTOR	68K0	1	A1-30068
R40	5% RESISTOR	100R	1	A1-10100
R41	5% RESISTOR	5K1	1	A1-15100
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	4741	1	D2-04741
U2	LINEAR IC QUAD	4741	1	D2-04741
U2S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U3	LINEAR IC QUAD	TLO74	1	D2-0L074
VR1	PIHER VER PRESET	220R	1	A3-G1220
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	10K	1	A3-G2010
VR4	72P TYPE PRESET	72P 50K	1	A3-E2050

DN 60 6K3 FILTER BOARD

C1	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C2	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C3	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C4	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500

DN 60 6K3 FILTER BOARD

-REF-	ITEM	VALUE	QTY	KTR:NO-
C5	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C11	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C12	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C13	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C14	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C15	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C22	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C23	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C24	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C31	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C32	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C33	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C34	CAP POLYPROPYLENE 5%	PMR7.5 1N5	1	B6-11500
C35	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C36	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D31	DIODE	1N4148	1	D1-A4148
D32	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
PC1	PCB 2549	DN60 FILTER	1	E6-02549
PP1	SMALL VERO PIN	SMALL VERO PIN	4	E2-N0001
R1	1% RESISTOR	27K0	1	A2-12700
R2	1% RESISTOR	820R	1	A2-08200
R2A	5% RESISTOR	100R	1	A1-10100
R3	1% RESISTOR	294K	1	A2-20294
R4	1% RESISTOR	30K9	1	A2-13090
R5	1% RESISTOR	953R	1	A2-09530
R5A	5% RESISTOR	100R	1	A1-10100
R6	1% RESISTOR	330K	1	A2-20330
R7	1% RESISTOR	34K8	1	A2-13480
R8	1% RESISTOR	39K	1	A2-13900
R9	5% RESISTOR	56K	1	A1-30056
R10	5% RESISTOR	1K8	1	A1-11800
R11	1% RESISTOR	22K	1	A2-12200
R12	1% RESISTOR	619R/620R	1	A2-06190
R12A	5% RESISTOR	100R	1	A1-10100
R13	1% RESISTOR	232K	1	A2-20232
R14	1% RESISTOR	24K9	1	A2-12490
R15	1% RESISTOR	732R	1	A2-07320
R15A	5% RESISTOR	100R	1	A1-10100
R16	1% RESISTOR	261K	1	A2-20261
R17	1% RESISTOR	34K8	1	A2-13480

DN 60 6K3 FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
R18	1% RESISTOR	39K	1	A2-13900
R19	5% RESISTOR	56K	1	A1-30056
R20	5% RESISTOR	1K8	1	A1-11800
R21	1% RESISTOR	20K	1	A2-12000
R22	1% RESISTOR	475R	1	A2-04750
R22A	5% RESISTOR	100R	1	A1-10100
R23	1% RESISTOR	187K	1	A2-20187
R24	1% RESISTOR	17K4	1	A2-11740
R25	1% RESISTOR	576R	1	A2-05760
R25A	5% RESISTOR	100R	1	A1-10100
R26	1% RESISTOR	210K	1	A2-20210
R27	1% RESISTOR	34K8	1	A2-13480
R28	1% RESISTOR	39K	1	A2-13900
R29	5% RESISTOR	56K	1	A1-30056
R30	5% RESISTOR	1K8	1	A1-11800
R31	1% RESISTOR	14K3	1	A2-11430
R32	1% RESISTOR	374R	1	A2-03740
R32A	5% RESISTOR	100R	1	A1-10100
R33	1% RESISTOR	147K	1	A2-20147
R34	1% RESISTOR	16K2	1	A2-11620
R35	1% RESISTOR	464R	1	A2-04640
R35A	5% RESISTOR	100R	1	A1-10100
R36	1% RESISTOR	165K	1	A2-20165
R37	1% RESISTOR	34K8	1	A2-13480
R38	1% RESISTOR	39K	1	A2-13900
R39	5% RESISTOR	56K	1	A1-30056
R40	5% RESISTOR	1K8	1	A1-11800
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	4741	1	D2-04741
U2	LINEAR IC QUAD	4741	1	D2-04741
U3	LINEAR IC QUAD	4741	1	D2-04741
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR1	PIHER VER PRESET	220R	1	A3-G1220
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	220R	1	A3-G1220
VR4	PIHER VER PRESET	220R	1	A3-G1220

DN 60 2K5 FILTER BOARD

C1	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C2	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C3	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C4	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C5	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C11	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C12	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C13	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C14	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C15	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C22	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C23	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600

DN 60 2K5 FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
C24	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C31	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C32	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C33	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C34	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C35	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C36	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D31	DIODE	1N4148	1	D1-A4148
D32	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
PC1	PCB 2549	DN60 FILTER	1	E6-02549
PP1	SMALL VERO PIN	SMALL VERO PIN	4	E2-N0001
R1	1% RESISTOR	16K9	1	A2-11690
R2	1% RESISTOR	649R	1	A2-06490
R2A	5% RESISTOR	100R	1	A1-10100
R3	1% RESISTOR	154K	1	A2-20154
R4	1% RESISTOR	18K7	1	A2-11870
R5	1% RESISTOR	787R	1	A2-07870
R5A	5% RESISTOR	100R	1	A1-10100
R6	1% RESISTOR	178K	1	A2-20178
R7	1% RESISTOR	34K8	1	A2-13480
R8	1% RESISTOR	39K	1	A2-13900
R9	5% RESISTOR	39K	1	A1-30039
R10	5% RESISTOR	1K8	1	A1-11800
R11	1% RESISTOR	14K	1	A2-11400
R12	1% RESISTOR	536R	1	A2-05360
R12A	5% RESISTOR	68R	1	A1-10068
R13	1% RESISTOR	124K	1	A2-20124
R14	1% RESISTOR	15K4	1	A2-11540
R15	1% RESISTOR	619R/620R	1	A2-06190
R15A	5% RESISTOR	68R	1	A1-10068
R16	1% RESISTOR	140K	1	A2-20140
R17	1% RESISTOR	34K8	1	A2-13480
R18	1% RESISTOR	39K	1	A2-13900
R19	5% RESISTOR	39K	1	A1-30039
R20	5% RESISTOR	1K8	1	A1-11800
R21	1% RESISTOR	11K3	1	A2-11130
R22	1% RESISTOR	432R	1	A2-04320
R22A	5% RESISTOR	68R	1	A1-10068
R23	1% RESISTOR	100K	1	A2-20100
R24	1% RESISTOR	12K7	1	A2-11270
R25	1% RESISTOR	499R	1	A2-04990
R25A	5% RESISTOR	68R	1	A1-10068
R26	1% RESISTOR	113K	1	A2-20113

DN 60 2K5 FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
R27	1% RESISTOR	34K8	1	A2-13480
R28	1% RESISTOR	39K	1	A2-13900
R29	5% RESISTOR	39K	1	A1-30039
R30	5% RESISTOR	1K8	1	A1-11800
R31	1% RESISTOR	9K1/9K09	1	A2-10909
R32	1% RESISTOR	332R	1	A2-03320
R32A	5% RESISTOR	68R	1	A1-10068
R33	1% RESISTOR	80K6	1	A2-18060
R34	1% RESISTOR	10K	1	A2-11000
R35	1% RESISTOR	390/392R	1	A2-03900
R35A	5% RESISTOR	68R	1	A1-10068
R36	1% RESISTOR	91K/90K9	1	A2-19100
R37	1% RESISTOR	34K8	1	A2-13480
R38	1% RESISTOR	39K	1	A2-13900
R39	5% RESISTOR	39K	1	A1-30039
R40	5% RESISTOR	1K8	1	A1-11800
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	UA 348	1	D2-00348
U2	LINEAR IC QUAD	4741	1	D2-04741
U3	LINEAR IC QUAD	4741	1	D2-04741
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR1	PIHER VER PRESET	220R	1	A3-G1220
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	220R	1	A3-G1220
VR4	PIHER VER PRESET	220R	1	A3-G1220

DN 60 1K FILTER BOARD

C1	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C2	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C3	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C4	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C5	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C11	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C12	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C13	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C14	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C15	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C22	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C23	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C24	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C31	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C32	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C33	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C34	CAP POLYPROPYLENE 5%	PMR7.5 5N6	1	B6-15600
C35	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C36	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
D1	DIODE	1N4148	1	D1-A4148

DN 60 1K FILTER BOARD

-REF-	ITEM	VALUE	QTY	KTR:NO-
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D31	DIODE	1N4148	1	D1-A4148
D32	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
PC1	PCB 2549	DN60 FILTER	1	E6-02549
PP1	SMALL VERO PIN	SMALL VERO PIN	4	E2-N0001
R1	1% RESISTOR	10K7	1	A2-11070
R2	1% RESISTOR	402R	1	A2-04020
R2A	5% RESISTOR	100R	1	A1-10100
R3	1% RESISTOR	97K6	1	A2-19760
R4	1% RESISTOR	12K	1	A2-11200
R5	1% RESISTOR	487R	1	A2-04870
R5A	5% RESISTOR	100R	1	A1-10100
R6	1% RESISTOR	115K	1	A2-20115
R7	1% RESISTOR	34K8	1	A2-13480
R8	1% RESISTOR	39K	1	A2-13900
R9	5% RESISTOR	39K	1	A1-30039
R10	5% RESISTOR	1K8	1	A1-11800
R11	1% RESISTOR	9K1/9K09	1	A2-10909
R12	1% RESISTOR	332R	1	A2-03320
R12A	5% RESISTOR	100R	1	A1-10100
R13	1% RESISTOR	80K6	1	A2-18060
R14	1% RESISTOR	10K	1	A2-11000
R15	1% RESISTOR	365R	1	A2-03650
R15A	5% RESISTOR	100R	1	A1-10100
R16	1% RESISTOR	91K/90K9	1	A2-19100
R17	1% RESISTOR	34K8	1	A2-13480
R18	1% RESISTOR	39K	1	A2-13900
R19	5% RESISTOR	39K	1	A1-30039
R20	5% RESISTOR	1K8	1	A1-11800
R21	1% RESISTOR	27K4	1	A2-12740
R22	1% RESISTOR	1K07	1	A2-10107
R22A	5% RESISTOR	100R	1	A1-10100
R23	1% RESISTOR	243K	1	A2-20243
R24	1% RESISTOR	30K9	1	A2-13090
R25	1% RESISTOR	1K27	1	A2-10127
R25A	5% RESISTOR	100R	1	A1-10100
R26	1% RESISTOR	280K	1	A2-20280
R27	1% RESISTOR	34K8	1	A2-13480
R28	1% RESISTOR	39K	1	A2-13900
R29	5% RESISTOR	39K	1	A1-30039
R30	5% RESISTOR	1K8	1	A1-11800
R31	1% RESISTOR	22K	1	A2-12200
R32	1% RESISTOR	845R	1	A2-08450
R32A	5% RESISTOR	100R	1	A1-10100
R33	1% RESISTOR	196K	1	A2-20196
R34	1% RESISTOR	24K	1	A2-12400
R35	1% RESISTOR	1K	1	A2-10100
R35A	5% RESISTOR	100R	1	A1-10100

DN 60 1K FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
R36	1% RESISTOR	220K/221K	1	A2-20220
R37	1% RESISTOR	34K8	1	A2-13480
R38	1% RESISTOR	39K	1	A2-13900
R39	5% RESISTOR	39K	1	A1-30039
R40	5% RESISTOR	1K8	1	A1-11800
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	UA 348	1	D2-00348
U2	LINEAR IC QUAD	UA 348	1	D2-00348
U3	LINEAR IC QUAD	4741	1	D2-04741
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR1	PIHER VER PRESET	220R	1	A3-G1220
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	220R	1	A3-G1220
VR4	PIHER VER PRESET	220R	1	A3-G1220

DN 60 400 Hz FILTER BOARD

C1	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C2	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C3	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C4	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C5	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C11	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C12	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C13	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C14	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C15	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C22	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C23	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C24	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C31	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C32	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C33	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C34	CAPACITOR POLYESTER	22N 5%	1	B1-20022
C35	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C36	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D31	DIODE	1N4148	1	D1-A4148
D32	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
PC1	PCB 2549	DN60 FILTER	1	E6-02549
PP1	SMALL VERO PIN	SMALL VERO PIN	4	E2-N0001
R1	1% RESISTOR	28K7	1	A2-12870

DN 60 400 Hz FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
R2	1% RESISTOR	1K1	1	A2-10110
R2A	5% RESISTOR	100R	1	A1-10100
R3	1% RESISTOR	255K	1	A2-20255
R4	1% RESISTOR	31K6	1	A2-13160
R5	1% RESISTOR	1K27	1	A2-10127
R5A	5% RESISTOR	100R	1	A1-10100
R6	1% RESISTOR	287K	1	A2-20287
R7	1% RESISTOR	34K8	1	A2-13480
R8	1% RESISTOR	39K	1	A2-13900
R9	5% RESISTOR	39K	1	A1-30039
R10	5% RESISTOR	1K8	1	A1-11800
R11	1% RESISTOR	22K6	1	A2-12260
R12	1% RESISTOR	887R	1	A2-08870
R12A	5% RESISTOR	100R	1	A1-10100
R13	1% RESISTOR	200K	1	A2-20200
R14	1% RESISTOR	25K5	1	A2-12550
R15	1% RESISTOR	1K02	1	A2-10102
R15A	5% RESISTOR	100R	1	A1-10100
R16	1% RESISTOR	232K	1	A2-20232
R17	1% RESISTOR	34K8	1	A2-13480
R18	1% RESISTOR	39K	1	A2-13900
R19	5% RESISTOR	39K	1	A1-30039
R20	5% RESISTOR	1K8	1	A1-11800
R21	1% RESISTOR	18K2	1	A2-11820
R22	1% RESISTOR	680R	1	A2-06800
R22A	5% RESISTOR	100R	1	A1-10100
R23	1% RESISTOR	158K	1	A2-20158
R24	1% RESISTOR	20K	1	A2-12000
R25	1% RESISTOR	787R	1	A2-07870
R25A	5% RESISTOR	100R	1	A1-10100
R26	1% RESISTOR	182K	1	A2-20182
R27	1% RESISTOR	34K8	1	A2-13480
R28	1% RESISTOR	39K	1	A2-13900
R29	5% RESISTOR	39K	1	A1-30039
R30	5% RESISTOR	1K8	1	A1-11800
R31	1% RESISTOR	14K3	1	A2-11430
R32	1% RESISTOR	510/511R	1	A2-05110
R32A	5% RESISTOR	100R	1	A1-10100
R33	1% RESISTOR	127K	1	A2-20127
R34	1% RESISTOR	15K8	1	A2-11580
R35	1% RESISTOR	619R/620R	1	A2-06190
R35A	5% RESISTOR	100R	1	A1-10100
R36	1% RESISTOR	143K	1	A2-20143
R37	1% RESISTOR	34K8	1	A2-13480
R38	1% RESISTOR	39K	1	A2-13900
R39	5% RESISTOR	39K	1	A1-30039
R40	5% RESISTOR	1K8	1	A1-11800
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	UA 348	1	D2-00348
U2	LINEAR IC QUAD	UA 348	1	D2-00348
U3	LINEAR IC QUAD	4741	1	D2-04741
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR1	PIHER VER PRESET	220R	1	A3-G1220

DN 60 400 Hz FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	220R	1	A3-G1220
VR4	PIHER VER PRESET	220R	1	A3-G1220

DN 60 160 Hz FILTER BOARD

C1	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C2	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C3	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C4	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C5	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C11	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C12	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C13	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C14	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C15	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C22	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C23	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C24	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C31	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C32	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C33	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C34	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C35	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C36	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D31	DIODE	1N4148	1	D1-A4148
D32	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
PC1	PCB 2549	DN60 FILTER	1	E6-02549
PP1	SMALL VERO PIN	SMALL VERO PIN	4	E2-N0001
R1	1% RESISTOR	16K	1	A2-11600
R2	1% RESISTOR	590R	1	A2-05900
R2A	5% RESISTOR	100R	1	A1-10100
R3	1% RESISTOR	140K	1	A2-20140
R4	1% RESISTOR	17K4	1	A2-11740
R5	1% RESISTOR	680R	1	A2-06800
R5A	5% RESISTOR	100R	1	A1-10100
R6	1% RESISTOR	160K	1	A2-20160
R7	1% RESISTOR	73K2	1	A2-17320
R8	1% RESISTOR	82K	1	A2-18200
R9	5% RESISTOR	82K	1	A1-30082
R10	5% RESISTOR	3K9	1	A1-13900

DN 60 160 Hz FILTER BOARD

-REF-	ITEM	VALUE	QTY	KTR:NO
R11	1% RESISTOR	12K7	1	A2-11270
R12	1% RESISTOR	464R	1	A2-04640
R12A	5% RESISTOR	100R	1	A1-10100
R13	1% RESISTOR	113K	1	A2-20113
R14	1% RESISTOR	14K	1	A2-11400
R15	1% RESISTOR	536R	1	A2-05360
R15A	5% RESISTOR	100R	1	A1-10100
R16	1% RESISTOR	130K	1	A2-20130
R17	1% RESISTOR	73K2	1	A2-17320
R18	1% RESISTOR	82K	1	A2-18200
R19	5% RESISTOR	82K	1	A1-30082
R20	5% RESISTOR	3K9	1	A1-13900
R21	1% RESISTOR	10K2	1	A2-11020
R22	1% RESISTOR	360R/357R	1	A2-03600
R22A	5% RESISTOR	100R	1	A1-10100
R23	1% RESISTOR	91K/90K9	1	A2-19100
R24	1% RESISTOR	11K3	1	A2-11130
R25	1% RESISTOR	422R	1	A2-04220
R25A	5% RESISTOR	100R	1	A1-10100
R26	1% RESISTOR	102K	1	A2-20102
R27	1% RESISTOR	34K8	1	A2-13480
R28	1% RESISTOR	39K	1	A2-13900
R29	5% RESISTOR	39K	1	A1-30039
R30	5% RESISTOR	1K8	1	A1-11800
R31	1% RESISTOR	8K06	1	A2-10806
R32	1% RESISTOR	267R	1	A2-02670
R32A	5% RESISTOR	68R	1	A1-10068
R33	1% RESISTOR	71K5	1	A2-17150
R34	1% RESISTOR	8K87	1	A2-10887
R35	1% RESISTOR	332R	1	A2-03320
R35A	5% RESISTOR	68R	1	A1-10068
R36	1% RESISTOR	82K	1	A2-18200
R37	1% RESISTOR	34K8	1	A2-13480
R38	1% RESISTOR	39K	1	A2-13900
R39	5% RESISTOR	39K	1	A1-30039
R40	5% RESISTOR	1K8	1	A1-11800
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	UA 348	1	D2-00348
U2	LINEAR IC QUAD	UA 348	1	D2-00348
U3	LINEAR IC QUAD	UA 348	1	D2-00348
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR1	PIHER VER PRESET	220R	1	A3-G1220
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	220R	1	A3-G1220
VR4	PIHER VER PRESET	220R	1	A3-G1220

DN 60 63 Hz FILTER BOARD

C1	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C2	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C3	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C4	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C5	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122

DN 60 63 Hz FILTER BOARD

-REF-	-ITEM-	-VALUE-	-QTY-	-KTR:NO-
C11	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C12	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C13	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C14	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C15	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C22	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C23	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C24	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C31	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C32	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C33	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C34	CAPACITOR POLYESTER	0.1MFD 5%	1	B1-20100
C35	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C36	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D31	DIODE	1N4148	1	D1-A4148
D32	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
PC1	PCB 2549	DN60 FILTER	1	E6-02549
PP1	SMALL VERO PIN	SMALL VERO PIN	4	E2-N0001
R1	1% RESISTOR	12K	1	A2-11200
R2	1% RESISTOR	453R	1	A2-04530
R2A	5% RESISTOR	100R	1	A1-10100
R3	1% RESISTOR	107K	1	A2-20107
R4	1% RESISTOR	13K7	1	A2-11370
R5	1% RESISTOR	510/511R	1	A2-05110
R5A	5% RESISTOR	100R	1	A1-10100
R6	1% RESISTOR	124K	1	A2-20124
R7	1% RESISTOR	196K	1	A2-20196
R8	1% RESISTOR	220K/221K	1	A2-20220
R9	5% RESISTOR	220K	1	A1-30220
R10	5% RESISTOR	9K1	1	A1-19100
R11	1% RESISTOR	9K53	1	A2-10953
R12	1% RESISTOR	360R/357R	1	A2-03600
R12A	5% RESISTOR	68R	1	A1-10068
R13	1% RESISTOR	84K5	1	A2-18450
R14	1% RESISTOR	10K7	1	A2-11070
R15	1% RESISTOR	412R	1	A2-04120
R15A	5% RESISTOR	68R	1	A1-10068
R16	1% RESISTOR	97K6	1	A2-19760
R17	1% RESISTOR	196K	1	A2-20196
R18	1% RESISTOR	220K/221K	1	A2-20220
R19	5% RESISTOR	220K	1	A1-30220

DN 60 63 Hz FILTER BOARD

-REF-	-----ITEM-----	-----VALUE-----	-----QTY-----	-----KTR:NO-----
R20	5% RESISTOR	9K1	1	A1-19100
R21	1% RESISTOR	25K5	1	A2-12550
R22	1% RESISTOR	953R	1	A2-09530
R22A	5% RESISTOR	100R	1	A1-10100
R23	1% RESISTOR	226K	1	A2-20226
R24	1% RESISTOR	28K	1	A2-12800
R25	1% RESISTOR	1K13	1	A2-10113
R25A	5% RESISTOR	100R	1	A1-10100
R26	1% RESISTOR	255K	1	A2-20255
R27	1% RESISTOR	196K	1	A2-20196
R28	1% RESISTOR	220K/221K	1	A2-20220
R29	5% RESISTOR	220K	1	A1-30220
R30	5% RESISTOR	9K1	1	A1-19100
R31	1% RESISTOR	20K5	1	A2-12050
R32	1% RESISTOR	768R	1	A2-07680
R32A	5% RESISTOR	100R	1	A1-10100
R33	1% RESISTOR	180K	1	A2-20180
R34	1% RESISTOR	22K6	1	A2-12260
R35	1% RESISTOR	887R	1	A2-08870
R35A	5% RESISTOR	100R	1	A1-10100
R36	1% RESISTOR	205K	1	A2-20205
R37	1% RESISTOR	73K2	1	A2-17320
R38	1% RESISTOR	82K	1	A2-18200
R39	5% RESISTOR	82K	1	A1-30082
R40	5% RESISTOR	3K9	1	A1-13900
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	UA 348	1	D2-00348
U2	LINEAR IC QUAD	UA 348	1	D2-00348
U3	LINEAR IC QUAD	UA 348	1	D2-00348
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	220R	1	A3-G1220
VR4	PIHER VER PRESET	220R	1	A3-G1220
VR11	PIHER VER PRESET	220R	1	A3-G1220

DN 60 25 Hz FILTER BOARD

C1	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C2	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C3	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C4	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C5	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C6	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C11	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C12	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C13	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C14	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C15	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C16	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C21	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C22	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C23	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C24	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C25	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210

DN 60 25 Hz FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
C26	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
C31	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C32	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C33	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C34	CAPACITOR POLYESTER	.33MFD 5%	1	B1-20330
C35	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
C36	CAP TANTALUM RADIAL	2.2/16V	1	B4-TB122
CC1	CAPACITOR CERAMIC	47N	2	B2-2A047
D1	DIODE	1N4148	1	D1-A4148
D2	DIODE	1N4148	1	D1-A4148
D11	DIODE	1N4148	1	D1-A4148
D12	DIODE	1N4148	1	D1-A4148
D21	DIODE	1N4148	1	D1-A4148
D22	DIODE	1N4148	1	D1-A4148
D31	DIODE	1N4148	1	D1-A4148
D32	DIODE	1N4148	1	D1-A4148
L1	ZERO OHM LINK	ZERO OHM LINK	7	A3-A0001
PP1	SMALL VERO PIN	SMALL VERO PIN	4	E2-N0001
PV1	PCB 2549	DN60 FILTER	1	E6-02549
R1	1% RESISTOR	30K9	1	A2-13090
R2	1% RESISTOR	1K15	1	A2-10115
R2A	5% RESISTOR	100R	1	A1-10100
R3	1% RESISTOR	274K	1	A2-20274
R4	1% RESISTOR	34K	1	A2-13400
R5	1% RESISTOR	1K37	1	A2-10137
R5A	5% RESISTOR	100R	1	A1-10100
R6	1% RESISTOR	309K	1	A2-20309
R7	1% RESISTOR	309K	1	A2-20309
R8	1% RESISTOR	390K	1	A2-20390
R9	5% RESISTOR	390K	1	A1-30390
R10	5% RESISTOR	18K	1	A1-30018
R11	1% RESISTOR	24K3	1	A2-12430
R12	1% RESISTOR	931R	1	A2-09310
R12A	5% RESISTOR	100R	1	A1-10100
R13	1% RESISTOR	215K	1	A2-20215
R14	1% RESISTOR	26K7	1	A2-12670
R15	1% RESISTOR	1K05	1	A2-10105
R15A	5% RESISTOR	100R	1	A1-10100
R16	1% RESISTOR	249K	1	A2-20249
R17	1% RESISTOR	348K	1	A2-20348
R18	1% RESISTOR	390K	1	A2-20390
R19	5% RESISTOR	390K	1	A1-30390
R20	5% RESISTOR	18K	1	A1-30018
R21	1% RESISTOR	19K1	1	A2-11910
R22	1% RESISTOR	715R	1	A2-07150
R22A	5% RESISTOR	100R	1	A1-10100
R23	1% RESISTOR	169K	1	A2-20169
R24	1% RESISTOR	21K	1	A2-12100
R25	1% RESISTOR	845R	1	A2-08450
R25A	5% RESISTOR	100R	1	A1-10100
R26	1% RESISTOR	196K	1	A2-20196
R27	1% RESISTOR	348K	1	A2-20348
R28	1% RESISTOR	390K	1	A2-20390

DN 60 25 Hz FILTER BOARD

REF	ITEM	VALUE	QTY	KTR:NO
R29	5% RESISTOR	390K	1	A1-30390
R30	5% RESISTOR	18K	1	A1-30018
R31	1% RESISTOR	15K4	1	A2-11540
R32	1% RESISTOR	576R	1	A2-05760
R32A	5% RESISTOR	100R	1	A1-10100
R33	1% RESISTOR	137K	1	A2-20137
R34	1% RESISTOR	16K9	1	A2-11690
R35	1% RESISTOR	665R	1	A2-06650
R35A	5% RESISTOR	100R	1	A1-10100
R36	1% RESISTOR	154K	1	A2-20154
R37	1% RESISTOR	196K	1	A2-20196
R38	1% RESISTOR	220K/221K	1	A2-20220
R39	5% RESISTOR	220K	1	A1-30220
R40	5% RESISTOR	9K1	1	A1-19100
ST1	MOLEX 8 WAY SOCKET	0.2X8 WAY RIGHT SKT	1	E2-BS08A
U1	LINEAR IC QUAD	UA 348	1	D2-00348
U2	LINEAR IC QUAD	UA 348	1	D2-00348
U3	LINEAR IC QUAD	UA 348	1	D2-00348
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
VR1	PIHER VER PRESET	220R	1	A3-G1220
VR2	PIHER VER PRESET	220R	1	A3-G1220
VR3	PIHER VER PRESET	220R	1	A3-G1220
VR4	PIHER VER PRESET	220R	1	A3-G1220

DN 60 SWITCH BOARD

D1	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D2	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D3	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D4	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D5	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D6	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D7	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D8	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D9	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D10	DIODE	1N4148	1	D1-A4148
D11	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D12	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D13	DIODE	1N4148	1	D1-A4148
D14	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D15	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D16	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D17	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D18	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D19	DIODE	1N4148	1	D1-A4148
D20	RED LED 3mm ROUND	GL-3AR2	1	D1-AL209
D21	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
K1	D6 CAP	BLACK SQUARE	8	E4-B0004
L1	ZERO OHM LINK	ZERO OHM LINK	2	A3-A0001
PC1	PCB 2619	DN60 SWITCH	1	E6-02619
R1	5% RESISTOR	680R	1	A1-10680
R2	5% RESISTOR	680R	1	A1-10680
R3	5% RESISTOR	680R	1	A1-10680
R4	5% RESISTOR	680R	1	A1-10680

DN 60 SWITCH BOARD

-REF-	ITEM	VALUE	QTY	KTR:NO-
R5	5% RESISTOR	680R	1	A1-10680
R6	5% RESISTOR	680R	1	A1-10680
R7	5% RESISTOR	680R	1	A1-10680
R8	5% RESISTOR	680R	1	A1-10680
R9	5% RESISTOR	680R	1	A1-10680
R10	5% RESISTOR	680R	1	A1-10680
R11	5% RESISTOR	680R	1	A1-10680
R12	5% RESISTOR	680R	1	A1-10680
R13	5% RESISTOR	680R	1	A1-10680
R14	5% RESISTOR	680R	1	A1-10680
R15	5% RESISTOR	680R	1	A1-10680
R16	5% RESISTOR	680R	1	A1-10680
R17	5% RESISTOR	680R	1	A1-10680
R18	5% RESISTOR	680R	1	A1-10680
R19	5% RESISTOR	680R	1	A1-10680
R20	5% RESISTOR	680R	1	A1-10680
R21	5% RESISTOR	680R	1	A1-10680
R22	5% RESISTOR	1K	1	A1-11000
R25	5% RESISTOR	680R	1	A1-10680
ST1	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST2	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
ST3	MOLEX 4 PIN	0.2 X 4PIN SET STD	2	E2-BP043
SW1	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW2	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW3	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW4	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW5	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW6	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW7	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW8	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111

DN 60 CHASSIS ASSEMBLY

IC1	REGULATOR 5V 5A	78H05 5V 5A T03	1	D2-78H05
P1	POT SING 1/4 SFT STD	2K2 LIN	1	A3-OD022
R1	5% RESISTOR	1K	1	A1-11000
ST1	XLR (3) INPUT	PANEL MOUNT STD 3WAY	1	E2-AP031
ST2	XLR OUTPUT (3)	PANEL MOUNT STD 3WAY	1	E2-AS031
ST3	T03 SOCKET	T03 SOCKET	1	E2-ES031
ST4	IEC MAINS INPUT	WITH FUSE HOLDER	1	E2-DS033
ZA1	SCREW	M3 X 6 P/HD BZP	12	F1-GB062
ZA2	SCREW	M3 X 10 RSD CSK CHRO	6	F1-FB101
ZA3	TAMPERROOF SCREW	M3 * 12MM	1	F1-PB122
ZB1	SHAKEPROOF WASHER	M3 BZP	24	F1-DB032
ZB2	SOLDER TAG	M3 TIN	1	F1-TB004
ZC1	NUTS	M3 BZP	6	F1-AB002
ZC2	LOCKNUT M3	LOCKNUT M3	1	F1-AB202
ZH1	DN60 CHASSIS	DN60 CHASSIS	1	E8-A0006
ZI1	MOUNTING KITS	T03 SILICONE WASHERS	1	H1-EA002
ZL1	PRE CUT WIRE	BLUE 7/0.2 - 60MM	2	G3-BIB11
ZS1	RUBBER SLEEVES	H30 X 25MM	5	H1-AA002
ZS2	RUBBER SLEEVES	H20 X 20MM	3	H1-AA001

DN 60 FINAL ASSEMBLY

REF	ITEM	VALUE	QTY	KTR:NO
K1	SIFAM KNOB COLLET	15MM 1/4 SFT BLK LIN	1	E4-AC002
K2	SIFAM CAP	15MM BLUE + LINE	1	E4-B6001
L1	PRE CUT WIRE	BLUE 7/0.2 - 60MM	3	G3-BIBEL
PC1	PCB 2541	DN60 ANTIFERENCE	1	E6-02541
ST1	XLR (3) INPUT	PANEL MOUNT STD 3WAY	1	E2-AP031
ZB1	SHAKEPROOF WASHER	M3 BZP	14	F1-DB032
ZB2	WASHER PLASTIC WHITE	WASHER PLASTIC WHITE	4	F1-CB039
ZB3	WASHER	NYLON WASHER	8	F1-CB035
ZC1	NUTS	M3 BZP	10	F1-AB002
ZD1	PILLAR 14MM	M3 THREAD + TAPPED	3	E4-P3B14
ZD2	NYLON SPACER	6-6-M3 CLR SPACER	4	E4-POE55
ZH1	DN60 FRONT PANEL	FRONT PANEL	1	E7-F0601

DN 60 TEST ASSEMBLY

FF1	FUSE	250mA TIME DELAY	2	E3-BA250
ZA1	SCREW	M3 X 10 RSD CSK CHRO	8	F1-FB101
ZA2	SCREW	M3 X 6 P/HD BZP	3	F1-GB062
ZB1	SHAKEPROOF WASHER	M3 BZP	6	F1-DB032
ZC1	NUTS	M3 BZP	3	F1-AB002
ZD1	PILLAR 20MM	M3 THREAD + TAPPED	3	E4-P3B20
ZF1	PCB 2556	DN60 FILTER LOCK BRD	1	E6-02556
ZF2	RS SPACER	20MM PILLAR	1	H1-DB001

DN 60 ICI CARD

C1	CAPACITOR CERAMIC	220PF	1	B2-10220
CC1	CAPACITOR CERAMIC	47N	5	B2-2A047
D1	DIODE	1N4148	1	D1-A4148
PC1	PCB 2557	DN60 ICI	1	E6-02557
PP1	SMALL VERO PIN	SMALL VERO PIN	2	E2-N0001
R2	5% RESISTOR	5K1	1	A1-15100
R3	5% RESISTOR	5K1	1	A1-15100
R4	5% RESISTOR	5K1	1	A1-15100
R5	5% RESISTOR	5K1	1	A1-15100
ST1	40 WAY PIN PLUG	40WAY PINDIL PLUG RB	2	E2-CP401
ST2	16 WAY PIN HEADER	16 WAY RIGHT HEADER	1	E2-CP163
ST3	16 WAY PIN HEADER	16 WAY RIGHT HEADER	1	E2-CP163
U1	2K X 8 EPROM IC	2716	1	D5-T2716
U1S	24 PIN DIL SOCKET	24 PIN DIL SOCKET	1	E2-ES241
U2	2K X 8 EPROM IC	2716	1	D5-T2716
U2S	24 PIN DIL SOCKET	24 PIN DIL SOCKET	1	E2-ES241
U3	1K X 4 SRAM IC	2114	1	D5-F2114
U3S	18 PIN DIL SOCKET	18 PIN DIL SOCKET	1	E2-ES181
U4	1K X 4 SRAM IC	2114	1	D5-F2114
U4S	18 PIN DIL SOCKET	18 PIN DIL SOCKET	1	E2-ES181
U5	TTL IC LS	74LS00	1	D3-7A000
U6	MICRO INTERFACE IC	6821	1	D5-6821M
U6S	40 PIN DIL SOCKET	40 PIN DIL SOCKET	1	E2-ES401

DN 60 PACKING KIT

SF1	FUSE	250mA TIME DELAY	2	E3-BA250
SF2	FUSE	3A TIME DELAY	2	E3-BQ003
ZA1	SCREW	M4 X 6 P/HD CHROME	8	F1-GC061
ZH1	DN60 COVER PAIR	DN60 COVERS	1	E8-B0007

DN 60 PACKING KIT

-REF-	-----ITEM-----	-----VALUE-----	-----QTY-----	-----KTR:NO-----
ZL1	MAINS PLUG LEAD	MAINS LEAD IEC/FREE	1	E2-DP031
ZP1	POLY PACKS	TYPE B 2U	1	H1-PPB2U
ZP2	CARDBOARD BOX	2U SIZE	1	H1-CB134

***** END OF LIST *****

RT 60 PARTS LIST

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RT 60 MAIN PCB ASSEMBLY

REF	ITEM	VALUE	QTY	KTR:NO
C1	CAPACITOR CERAMIC	82PF	1	B2-10082
CC1	CAPACITOR CERAMIC	47N	1	B2-2A047
CC2	CAP ELECTROLYTIC RAD	10/16V	1	B4-DB210
D1	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D2	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D3	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D4	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D5	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D6	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D7	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
D8	RED LED RECTANGULAR	GL-9PR2	1	D1-A5531
K1	D6 CAP	BLACK SQUARE	6	E4-B0004
PC1	PCB 2558	DN60 RT60	1	E6-02558
Q1	TRANSISTOR	BC184 OR EQUIV	1	D1-C184C
Q2	TRANSISTOR	BC184 OR EQUIV	1	D1-C184C
Q3	TRANSISTOR	BC184 OR EQUIV	1	D1-C184C
Q4	TRANSISTOR	BC184 OR EQUIV	1	D1-C184C
R1	5% RESISTOR	100K	1	A1-30100
R2	5% RESISTOR	100K	1	A1-30100
R3	5% RESISTOR	100K	1	A1-30100
R4	5% RESISTOR	150R	1	A1-10150
R5	5% RESISTOR	150R	1	A1-10150
R6	5% RESISTOR	150R	1	A1-10150
R7	5% RESISTOR	150R	1	A1-10150
R8	5% RESISTOR	150R	1	A1-10150
R9	5% RESISTOR	150R	1	A1-10150
R10	5% RESISTOR	150R	1	A1-10150
R11	5% RESISTOR	150R	1	A1-10150
R12	5% RESISTOR	10K	1	A1-30010
R13	5% RESISTOR	10K	1	A1-30010
R14	5% RESISTOR	10K	1	A1-30010
R15	5% RESISTOR	1K	1	A1-11000
R16	5% RESISTOR	100K	1	A1-30100
R17	5% RESISTOR	150R	1	A1-10150
R18	5% RESISTOR	10K	1	A1-30010
R19	5% RESISTOR	150R	1	A1-10150
R20	5% RESISTOR	150R	1	A1-10150
R21	5% RESISTOR	1K	1	A1-11000
R22	5% RESISTOR	1K	1	A1-11000
R23	5% RESISTOR	150R	1	A1-10150
R24	5% RESISTOR	150R	1	A1-10150
R25	5% RESISTOR	1K	1	A1-11000
R26	5% RESISTOR	150R	1	A1-10150
R27	5% RESISTOR	150R	1	A1-10150
R28	5% RESISTOR	1K	1	A1-11000
R29	5% RESISTOR	1K	1	A1-11000
R30	5% RESISTOR	150R	1	A1-10150
ST1	16 WAY SOCKET	16WAY SOC STD RIBBON	1	E2-CP161
ST2	16 WAY PIN PLUG	16 WAY DIL RIBBON	1	E2-CP162
SW1	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW2	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111

RT 60 MAIN PCB ASSEMBLY

-REF-	ITEM	VALUE	QTY	KTR:NO-
SW3	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW4	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW5	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
SW6	MOMENTRY PUSH SWITCH	BLACK D6	1	E1-BB111
U1	7 SEGMENT DISPLAY	5082-7740	1	D1-B7740
U1S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U2	7 SEGMENT DISPLAY	5082-7740	1	D1-B7740
U2	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U3	7 SEGMENT DISPLAY	5082-7740	1	D1-B7740
U3S	14 PIN DIL SOCKET	14 PIN DIL SOCKET	1	E2-ES141
U4	CMOS IC	74C911	1	D4-4C911
U4S	28 PIN DIL SOCKET	28 PIN DIL SOCKET	1	E2-ES281
U5	TTL IC LS	74LS373	1	D3-7A373
ZB1	WASHER PLASTIC WHITE	WASHER PLASTIC WHITE	4	F1-CB039
ZB2	WASHER	M3 PLAIN S/STEEL	4	F1-CB031
ZC1	NUTS	M3 BZP	4	F1-AB002
ZD1	PILLAR 20MM	M3 THREAD + TAPPED	4	E4-P3B20
ZD2	PILLAR 1/4 INCH GRY	GREY M3 CLR HOLE	4	E4-POE06
ZH1	RT60 FRONT PANEL	FRONT PANEL	1	E7-F0661
ZH2	RT60 COVER	RT60 COVER	1	E8-B0010

***** END OF LIST *****