

SERVICE MANUAL

Demultiplexer

MH677A

Multiplexer

MH676A

ANRITSU

SERVICE MANUAL
MULTIPIXER
MH676A
DEMULTIPIXER
MH677A

CERTIFICATION

ANRITSU CORPORATION certifies that this instrument has been thoroughly tested and inspected, and found to meet published specifications prior to shipping. Anritsu further certifies that its calibration measurements are based on the Japanese Electrotechnical Laboratory and Radio Research Laboratory standards.

WARRANTY

All parts of this product are warranted by Anritsu Corporation of Japan against defects in material or workmanship for a period of one year from the date of delivery. In the event of a defect occurring during the warranty period, Anritsu Corporation will repair or replace this product within a reasonable period of time after notification, free-of-charge, provided that: it is returned to Anritsu; has not been misused; has not been damaged by an act of God; and that the user has followed the instructions in the operation manual. Any unauthorized modification, repair, or attempt to repair, will render this warranty void.

This warranty is effective only for the original purchaser of this product and is not transferable if it is resold.

ALL OTHER EXPRESSED WARRANTIES ARE DISCLAIMED AND ALL IMPLIED WARRANTIES FOR THIS PRODUCT, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO A PERIOD OF ONE YEAR FROM THE DATE OF DELIVERY. IN NO EVENT SHALL ANRITSU CORPORATION BE LIABLE TO THE CUSTOMER FOR ANY DAMAGES, INCLUDING LOST PROFITS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES, ARISING OUT OF THE USE OR INABILITY TO USE THIS PRODUCT.

All requests for repair or replacement under this warranty must be made as soon as possible after the defect has been noticed and must be directed to Anritsu Corporation or its representative in your area.

Copyright © 1987 by ANRITSU CORP. Printed in Japan. All rights reserved. No part of this manual may be reproduced in any form without written permission of ANRITSU CORP.

ERRATA

| ITEM | DESCRIPTION | |
|------------|-----------------|--|
| PARTS LIST | ERROR | CORRECT |
| | Battery, (ER-6) | Battery with resistor, (S49Z10069E) |

| | | | | |
|------|-----------|---|-------|------|
| Page | SECTION 1 | GENERAL | ..... | 1-1 |
| | SECTION 2 | MECHANICAL CONFIGURATION | ..... |  |
| | 2.1 | MH676A and MH677A Disassembly | ..... | 2-1 |
| | 2.2 | MH676A and MH677A Internal Views | ..... | 2-7 |
| | SECTION 3 | TROUBLESHOOTING AND ADJUSTMENTS | ..... |  |
| | 3.1 | Introduction | ..... | 3-1 |
| | 3.2 | Checking and Replacing Parts | ..... | 3-2 |
| | 3.2.1 | Explanation of identification markings on PC boards | ..... | 3-2 |
| | 3.2.2 | Notes on soldering | ..... | 3-3 |
| | 3.2.3 | Transistor checks | ..... | 3-3 |
| | 3.2.4 | Field effect transistor (FET) handling notes | ..... | 3-4 |
| | 3.4 | Circuit Reference | ..... | 3-6 |
| | 3.5 | MH676A Troubleshooting | ..... | 3-7 |
| | 3.5.1 | MH676A Z5 Motherboard PC board | ..... | 3-13 |
| | 3.5.2 | MH676A Z4 Power supply PC board | ..... | 3-17 |
| | 3.5.3 | MH676A Z3 Control PC board | ..... | 3-27 |
| | 3.5.4 | MH676A Z2 Multiplexer input PC board | ..... | 3-43 |

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

| | | |
|-------|-------|----------------------------------|
| Page | | |
| 3-67 | 3.5.5 | MH676A Z1 Multiplexer output |
| 3-91 | 3.5.6 | PC board |
| 3-105 | 3.5.6 | MH676A Z6 Display PC board |
| 3-112 | 3.5.6 | Z13 GP-IB , and Z14 RS-232C |
| 3-115 | 3.6 | PC board |
| 3-119 | 3.6.1 | MH677A Z5 MOTHERBOARD |
| 3-135 | 3.6.2 | MH677A Z4 Power supply PC board |
| 3-157 | 3.6.3 | MH677A Z3 Control PC board |
| | 3.6.4 | MH677A Z2 CLOCK DELAY PC board |
| | 3.6.5 | MH677A Z1 Demultiplexer PC board |
| | 3.6.6 | MH676A Z6 Display PC board , |
| | | Z13 GP-IB PC board , and Z14 |
| 3-181 | | RS-242C PC board |
| 4-1 | 4.1 | Introduction |
| 4-3 | 4.2 | Reading Capacitors/Resistors |
| 4-3 | 4.2.1 | Capacitor identification |
| 4-4 | 4.2.2 | Resistor identification |
| 4-5 | 4.3 | Ordering Information |
| 4-6 | 4.4 | Parts List |

SECTION 4 REPLACEABLE PARTS

For specifications, operating instructions, performance check, and a detailed panel control description of the MH676A and MH677A, refer to the separate operation manual.

lists.

Explains how to order replacement parts and gives the parts

SECTION 4 REPLACABLE PARTS:

Describes how to troubleshoot the equipment. Circuit diagrams for the MH676A and MH677A are given in this section.

SECTION 3 TROUBLESHOOTING AND ADJUSTMENT

boards) are laid out.

Describes how the various printed circuit boards (PC

SECTION 2 MECHANICAL CONFIGURATION:

It covers the following information:

This is the Service Manual for the MH676A and MH677A.

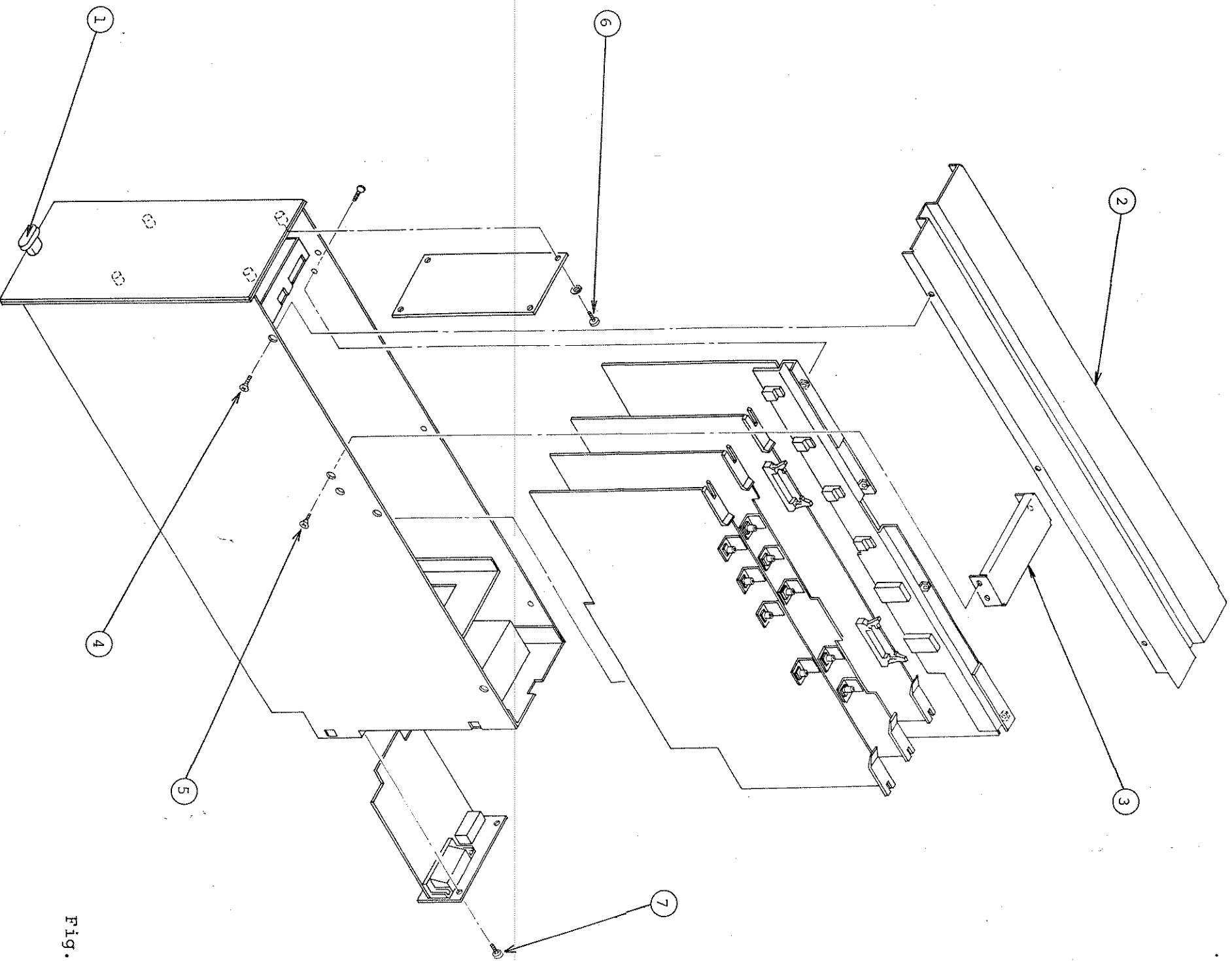
GENERAL

SECTION 1

- 2.1 MH676A and MH677A Disassembly
- Figure 2-1 and 2-2 show the disassembly of the MH676A and MH677A.
- (1) Top cover ② removal
Remove the six screws ④.
Then, remove the top cover ②.
 - (2) Board clamp ③ removal
Remove the three screws ⑤.
Then, remove the board clamp ③.

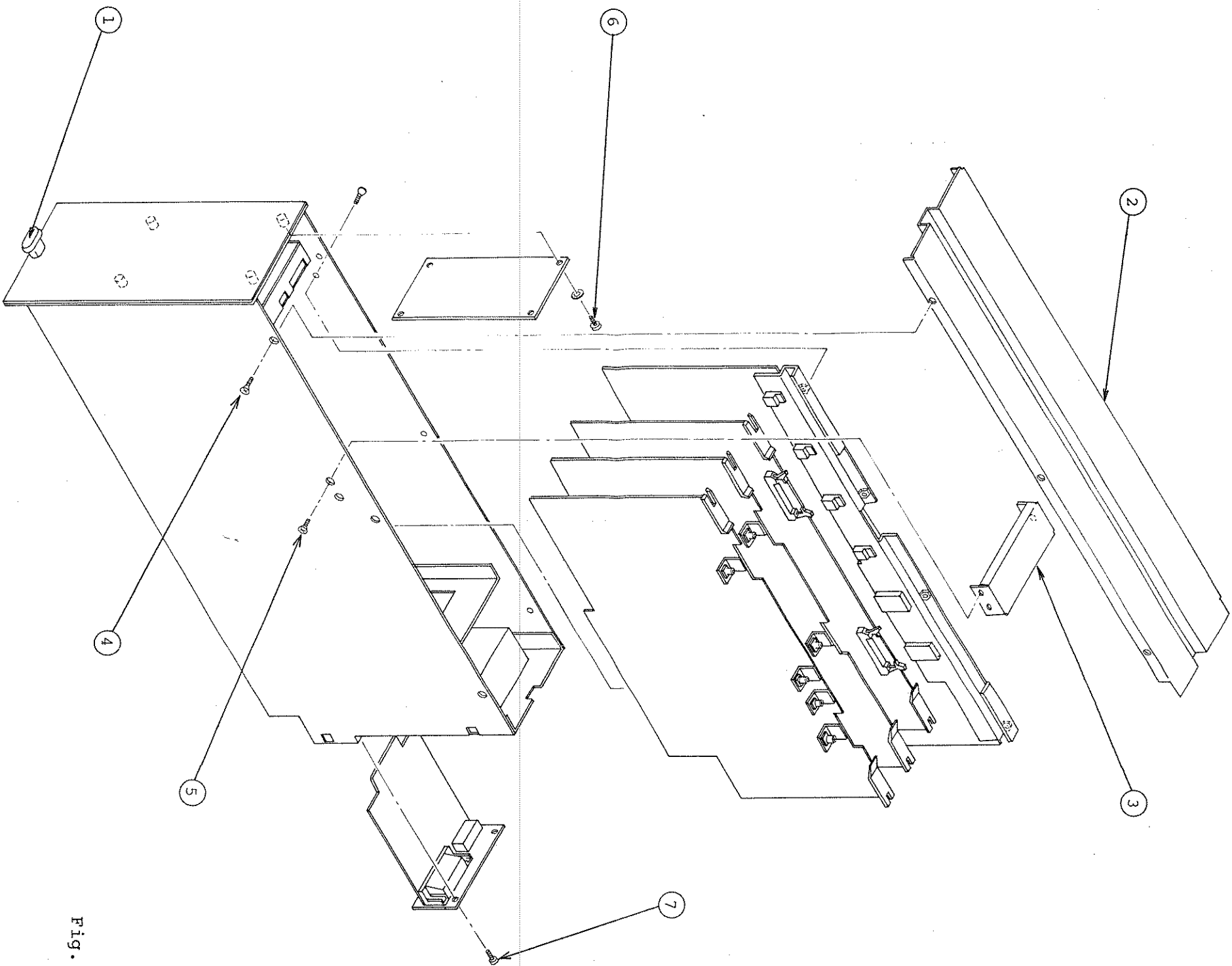
MECHANICAL CONFIGURATION

SECTION 2



| NO. | PARTS NO. | DESCRIPTION | REMARKS | Q'TY |
|-----|---------------|-------------|---------|------|
| 1 | 44B55948 | Knob | | 1 |
| 2 | 432B33632 | Cover | | 1 |
| 3 | 442B84978 | Board clamp | | 1 |
| 4 | 2.6FPS6B3 | Screw | | 6 |
| 5 | 3FPS8B3 | Screw | | 7 |
| 6 | 3NPS6B3 + SW | Screw | | 4 |
| 7 | 3BPS8S3 + MBS | Screw | | 4 |

Fig. 2-1 MH676A Disassembly



| NO. | PARTS NO. | DESCRIPTION | REMARKS | Q'TY |
|-----|---------------|-------------|---------|------|
| 1 | 44B55948 | Knob | | 1 |
| 2 | 432B33632 | Cover | | 1 |
| 3 | 442B84978 | Board clamp | | 1 |
| 4 | 2.6FPS6B3 | Screw | | 6 |
| 5 | 3FPS8B3 | Screw | | 7 |
| 6 | 3NPS6B3 + SW | Screw | | 4 |
| 7 | 3BPS8S3 + WBS | Screw | | 4 |

Fig. 2-2 MH677A Disassembly

2.2 MH676A and MH677A Internal Views

Figure 2-3 and 2-4 show the internal views of the MH676A and MH677A.

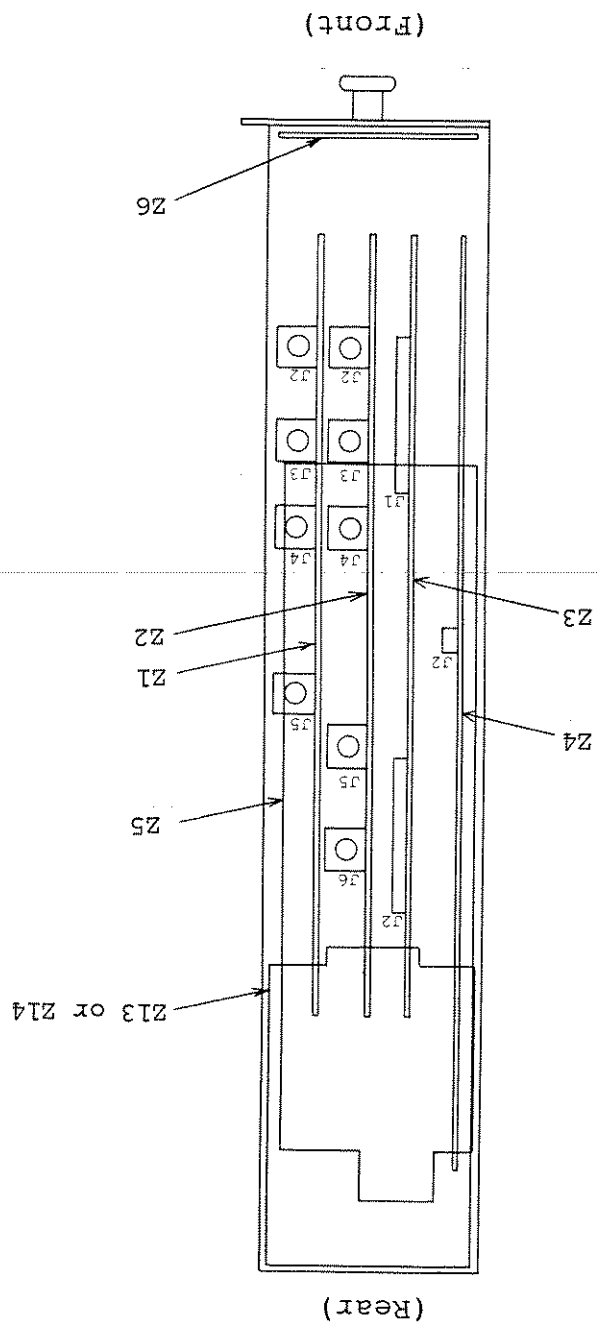
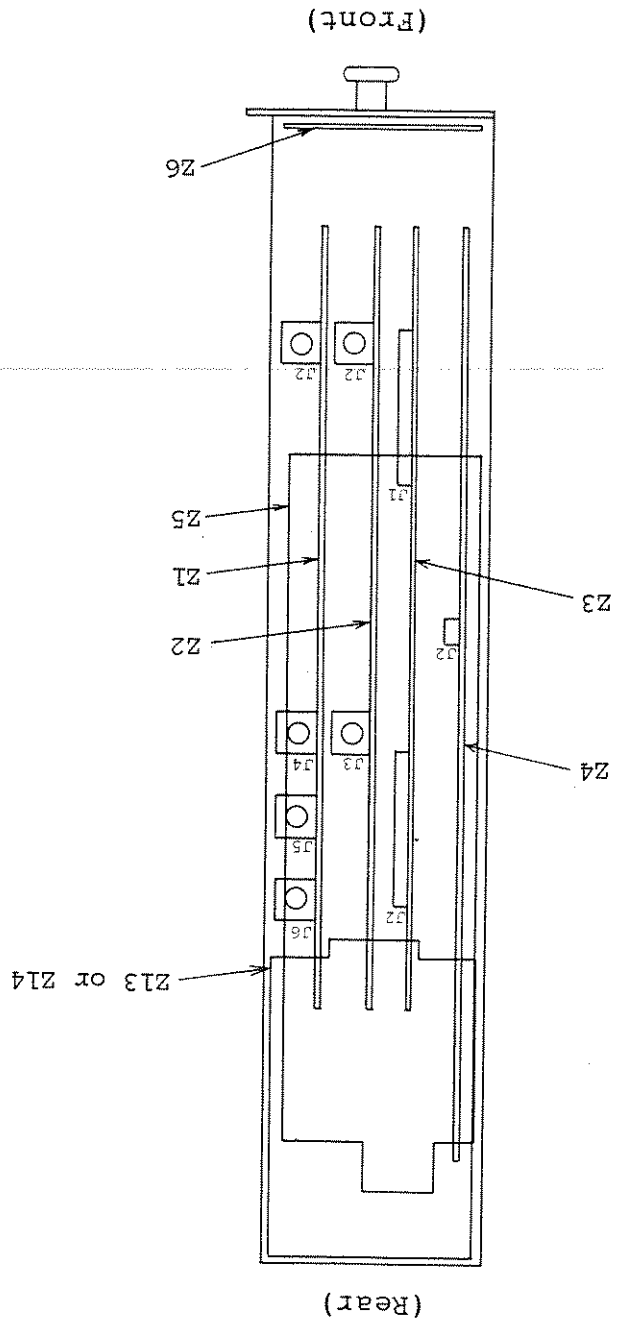


Fig. 2-3 MH676A Top View

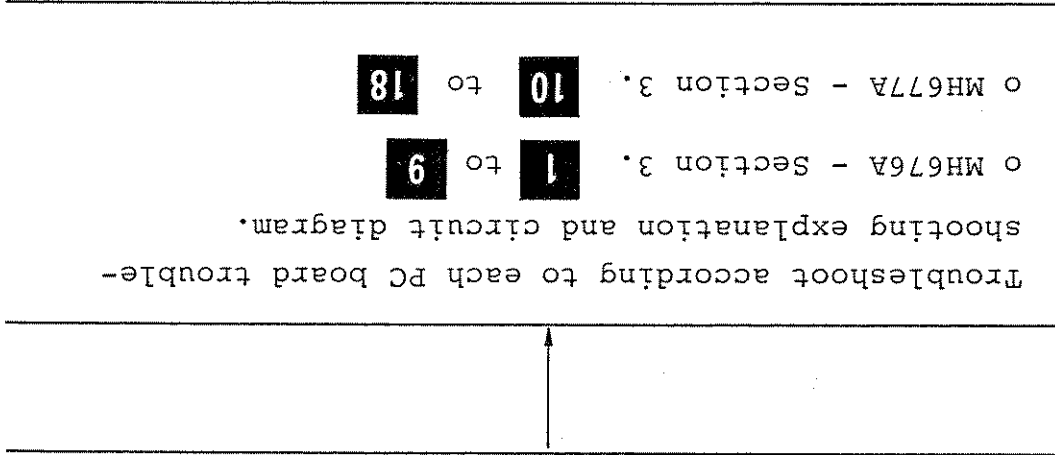
Fig. 2-4 MH677A Top View



(Front)

(Rear)

Fig. 3-1 Troubleshooting Procedure



MH677A + Fig. 3-20

- o Block diagram: MH676A + Fig. 3-3
 - o Performance Test (Operation Manual, Section 4)
- Find the malfunctioning PC board:

Troubleshooting can be diagrammed as follows.

adjustments.

This section also explains checking and replacement of parts, principles of operation (providing details on circuits), and the tools necessary to make repairs and adjustments.

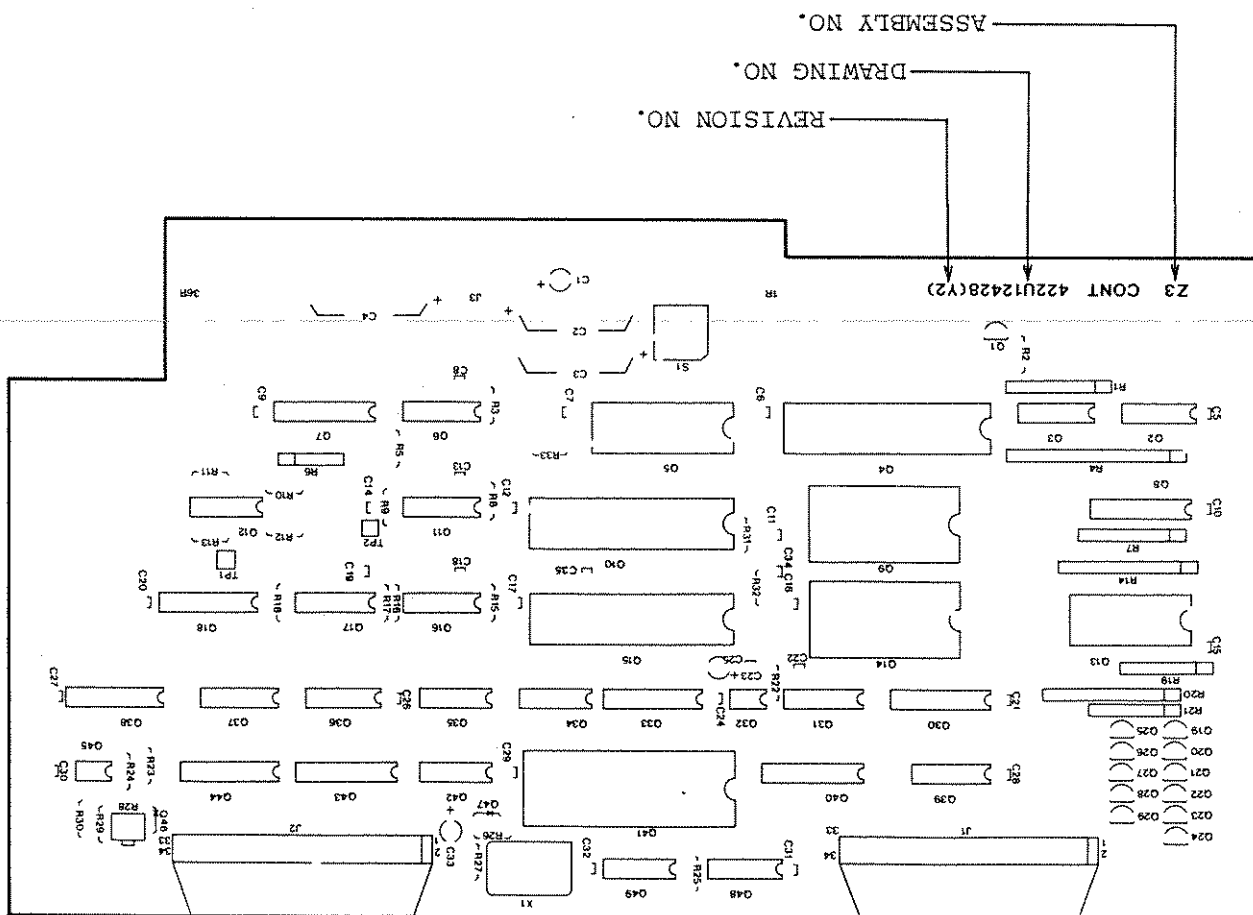
SECTION 3 describes how to troubleshoot and adjust the instrument when trouble occurs during measurement or when abnormalities are detected during performance checks of the operation.

3.1 Introduction

SECTION 3 TROUBLESHOOTING AND ADJUSTMENTS

SECTION 3

Fig. 3-2 PC Board Markings



3.2.1 Explanation of identification markings on PC boards
 As shown in Fig. 3-2, the MH676A and MH677A PC boards have a unified ASSEMBLY number, DRAWING number, and REVISION number.

3.2 Checking and Replacing Parts

3.2.2 Notes on Soldering

- (1) Use an ordinary 30- to 40-watt pencil-type soldering iron.

- (2) Before using the soldering iron, be sure it is electrically insulated. If it is not, it may damage the part.

- (3) When removing a soldered part from a circuit board or soldering in a new part, nip the part lead with tweezers to shunt heat.

- (4) The tips of major part leads are bent behind the PC board to ensure tight support. To remove a part, first lift up the tips of the leads and then remove the part.

- (5) When soldering a chip part (capacitance or resistance chip with no lead), use 310°C for one to four seconds.

3.2.3 Transistor checks

- (1) Mounted on PC board

Transistors can be checked for correct operation by measuring the base and emitter potentials. The NPN-type silicon transistor has a base potential 0.6 or 0.7 V higher than the emitter potential. In the PNP silicon transistor, the former is 0.6 or 0.7 V lower than the latter. Transistors are faulty if these relationships are not satisfied.

- (2) Removed from PC board

Transistors can be checked by measuring the resistance values among the emitter, base, and collector using a circuit tester. Standard values are given in Table 3-1. Note that the measuring current should be less than 100 μ A.

3.2.4 Field effect transistor (FET) handling notes

The FET in this device is used for high-speed switching because the withstand voltages between the gate and source, and drain and source are as low as approx. 5 V. Therefore, do not subject the FET to static electric discharges.

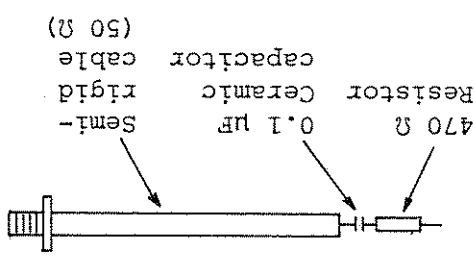
Before checking the FET and its peripheral circuits, make sure that you, the device, and all other measuring equipment being used are grounded (to earth potential) to prevent static electricity buildup.

Although the impedances of the FET between the gate and drain, and gate and source are very high (more than several hundred kΩ), the impedance between the drain and source is only several ohms.

Table 3-1 Unmounted Transistor Lead Resistances

| Type of Transistor | Circuit Tested | | Measured resistance |
|--------------------|--------------------|--------------------|---------------------|
| | Positive lead to | Negative lead to | |
| PNP silicon | Emitter, Collector | Base | 1 to 10 kΩ |
| | Emitter | Collector | Very high |
| NPN silicon | Base | Emitter, Collector | 1 to 10 kΩ |
| | Emitter | Collector | Very high |

| No. | Name (Recommended Type) | Major Specification Required |
|-----|----------------------------|---------------------------------------|
| 1 | Sampling Oscilloscope | Frequency: Dc to 10 GHz |
| 2 | Synchroscope | Frequency: Dc to 50 MHz |
| 3 | Dc Voltmeter | Range : to 40 V Resolution: 0.01 V |
| 4 | Probe | Frequency : 1 MHz to 3 GHz |



470 Ω Resistor
Ceramic rigid
0.1 μF Capacitor
Semi-rigid coaxial cable
(50 Ω)

| | | |
|---|----------------------|---|
| 5 | Extender PC board | Connect this board to the motherboard for PC board troubleshooting (Qty. 2) |
| 6 | Conversion connector | BNC·P + SMA·J (Qty. 3) |
| 7 | 1 m Coaxial cable | SMA(P) [RG58A/U] SMA(P) (Qty. 3) |
| 8 | 0.5 m Coaxial cable | SMA(P) [RG58A/U] SMA(P) (Qty. 2) |

Table 3-2 Recommended Test Equipment

3.4 Circuit References

The MH676A, MH677A PC boards have reference assembly numbers called Z numbers (Fig. 3-2) Tables 3-3 and 3-4 list the Z numbers, circuit diagram names, PC board drawing numbers, and parts list numbers. The SCHEMATIC Nos. are the numbers of the circuit diagrams shown in this section. Parts lists are given in SECTION 4.

Table 3-3 MH676A Circuit References

| SCHEMATIC No. | Circuit Diagram Name | Z No. | PC Board Drawing No. | Parts List No. |
|---------------|----------------------|-------|----------------------|----------------|
| 1 | MH676A | | | 44W83349 |
| 2 | MOTHERBOARD | Z5 | 422U12432 | 44W83354 |
| 3 | POWER SUPPLY | Z4 | 422U12430 | 44W83353 |
| 4 | CONTROL | Z3 | 422U12428 | 44W83352 |
| 5 | MUX INPUT | Z2 | 442U12426 | 44W83351 |
| 6 | MUX OUTPUT | Z1 | 422U12424 | 44W83350 |
| 7 | DISPLAY | Z6 | 432U33604 | 44W83355 |
| 8 | GP-IB | Z13 | 442U83054 | 44W83046 |
| 9 | RS-232C | Z14 | 442U83056 | 44W83047 |

Table 3-4 MH676A Circuit References

| SCHMATIC No. | Circuit Diagram Name | Z No. | PC Board Drawing No. | Parts List No. |
|--------------|----------------------|-------|----------------------|----------------|
| 10 | MH677A | | | 44W83356 |
| 11 * | MOTHERBOARD | Z5 | 422U12432 | 44W83354 |
| 12 * | POWER SUPPLY | Z4 | 422U12430 | 44W83353 |
| 13 * | CONTROL | Z3 | 422U12428 | 44W83352 |
| 14 | CLOCK DELAY | Z2 | 422U12498 | 44W83358 |
| 15 | DEMUX | Z1 | 422U12496 | 44W83357 |
| 16 | DISPLAY | Z6 | 432U33606 | 44W83360 |
| 17 * | GP-IB | Z13 | 442U83054 | 44W83046 |
| 18 * | RS-232C | Z14 | 442U83056 | 44W83047 |

* Same as MH676A

3.5 MH676A Troubleshooting

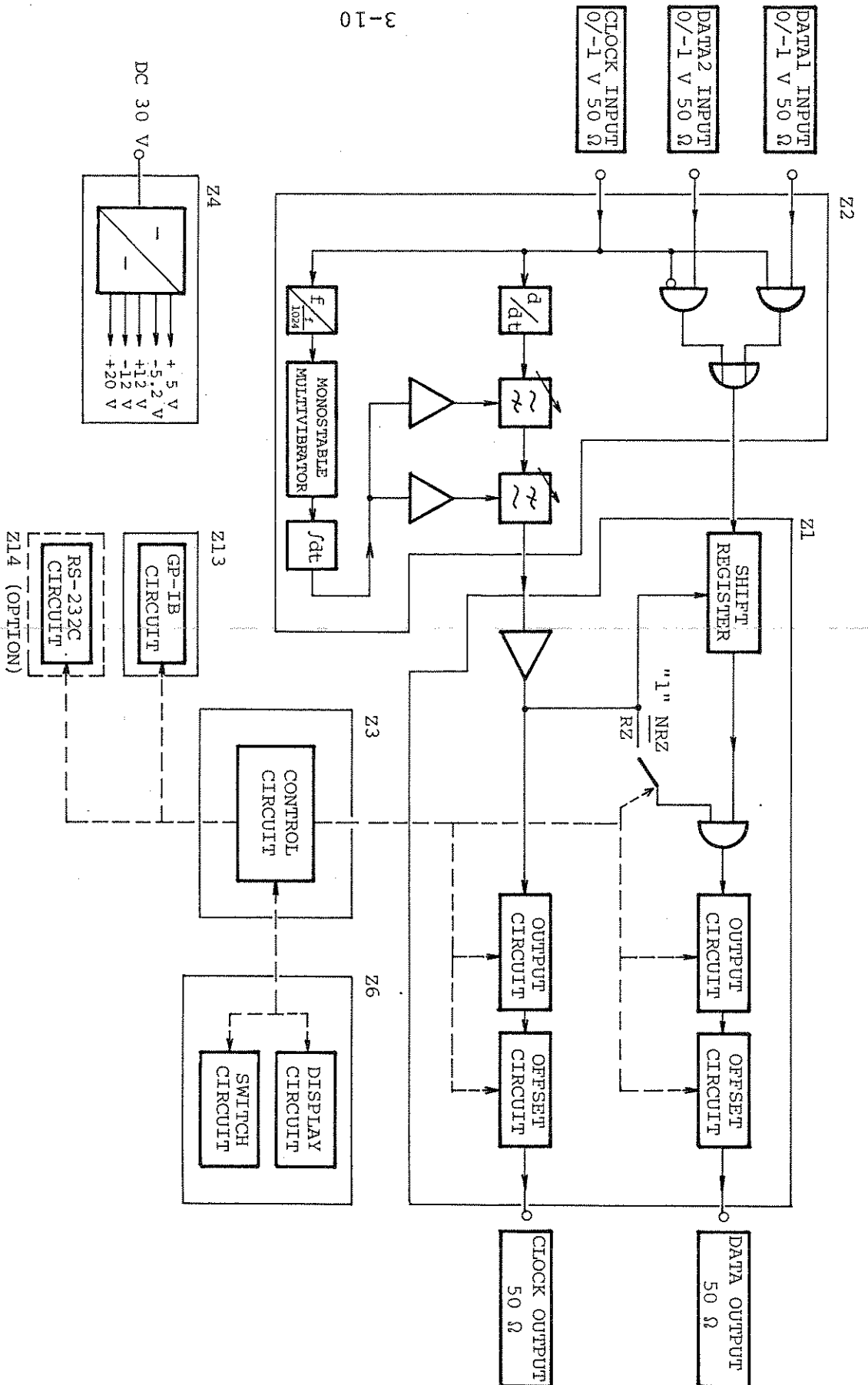
Figure 3-3 shows the MH676A block diagram, consisting of PC boards Z1 to Z6, and Z13 or Z14 (listed in Table 3-3). The functions of the PC boards are outlined below. See paragraphs 3.5.1 to 3.5.6 for more details.

(1) Motherboard circuit (Z5)

The motherboard circuit receives dc power from the MB522A Transmitter and supplies the power supply circuit (Z4). It also transfers power and control signals between PC boards Z1 to Z3.

- (2) Power supply circuit (Z4) The power supply circuit generates various dc power voltages from the power received from the MB522A Transmitter via the motherboard, and supplies the other PC boards.
- (3) Control circuit (Z3) The control circuit receives switch operation signals from the display circuit (Z6) and converts them into control signals. The AMPLITUDE and OFFSET levels are set for output and display signals are generated. This circuit also receives signals from the GP-IB or RS-232C circuit (Z13 or Z14) and converts them into control signals.
- (4) Multiplexer input circuit (Z2) The multiplexer input circuit receives DATA1 and DATA2, and CLOCK signals from the transmitter and doubles their speeds.
- (5) Multiplexer output circuit (Z1) The multiplexer output circuit receives DATA and CLOCK signals from the multiplexer input circuit, shapes the waveform, and changes the data format (NRZ/RZ). The signals are then output at variable AMPLITUDE and OFFSET levels.
- (6) Display circuit (Z6) The display circuit displays the switch operation states and the AMPLITUDE and OFFSET levels according to control signals received from the control circuit.

(7) GP-IB circuit (Z13) or RS-232C circuit (Z14)
The GP-IB or RS-232C circuit receives signals
from an external controller and converts them into
interface signals for the control circuit.
Note:
See SECTION 2 for the mechanical configuration
required for troubleshooting.



3-10

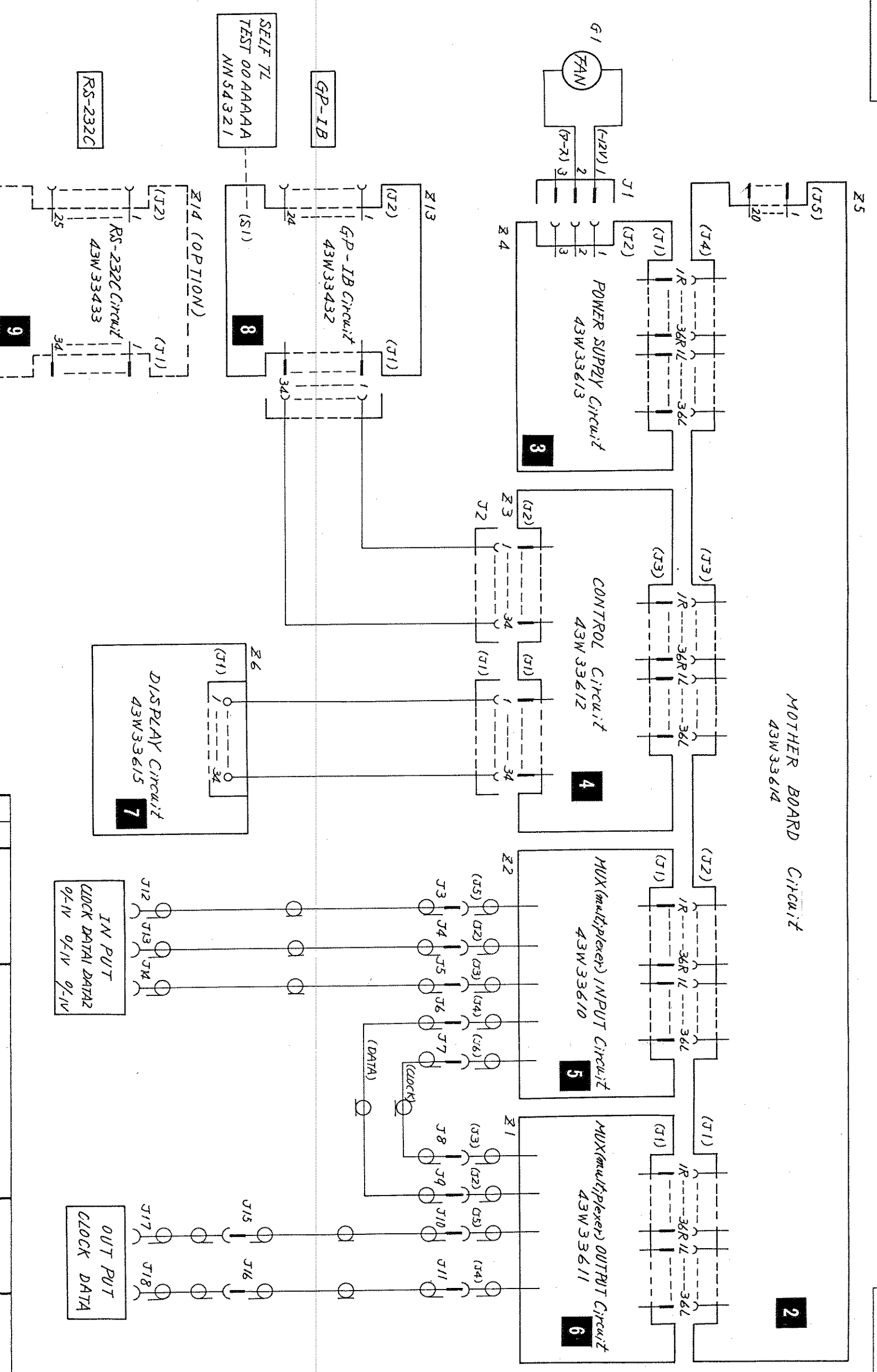
Fig. 3-3 MH676A MULTIPLEXER Block Diagram

APPLICATION

REVISIONS

MOTHER BOARD Circuit

43W33614



| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

CHECKED BY:
 TRACED BY:
 APPROVED BY:
 DRAWN BY: *Miyabuchi*

TITLE: MULTIPLEXER (MUX) MH676A
Circuit Diagram

DRAWING No. 43W33609

Parts List 44W83349

No. 0023-1985-08

| | | | | | | | | |
|----------|---|---|---|---|---|---|---|---|
| 43W33609 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------|---|---|---|---|---|---|---|---|

ANRITSU CORP. 3-11/3-12

3-13/(3-14 blank)

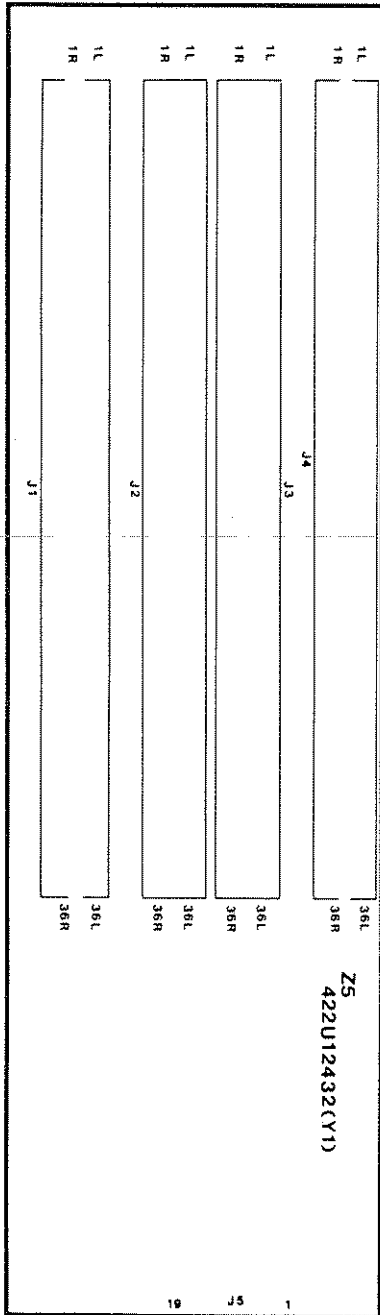
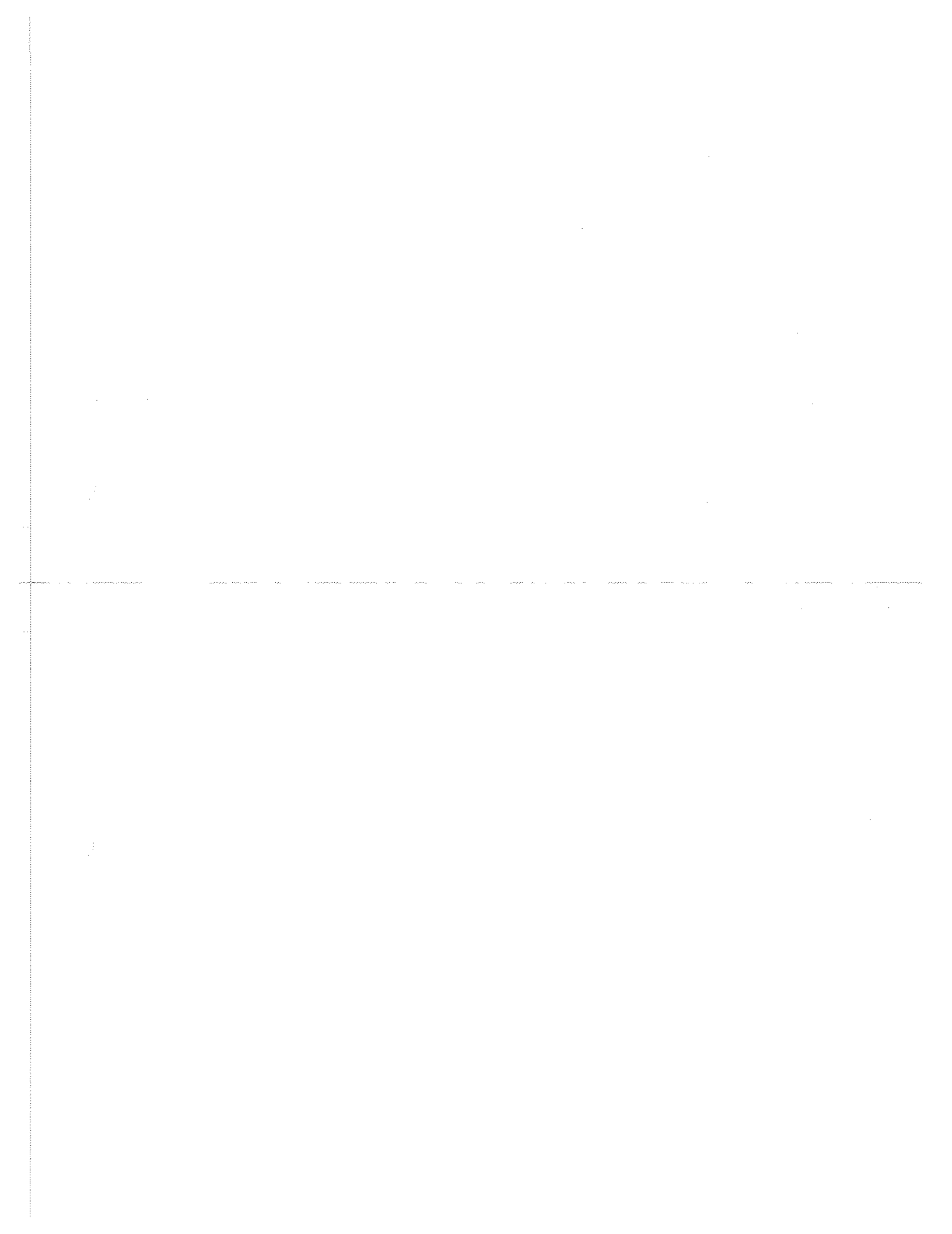


Fig. 3-4 Parts Layout of Z5 Motherboard PC Board

2

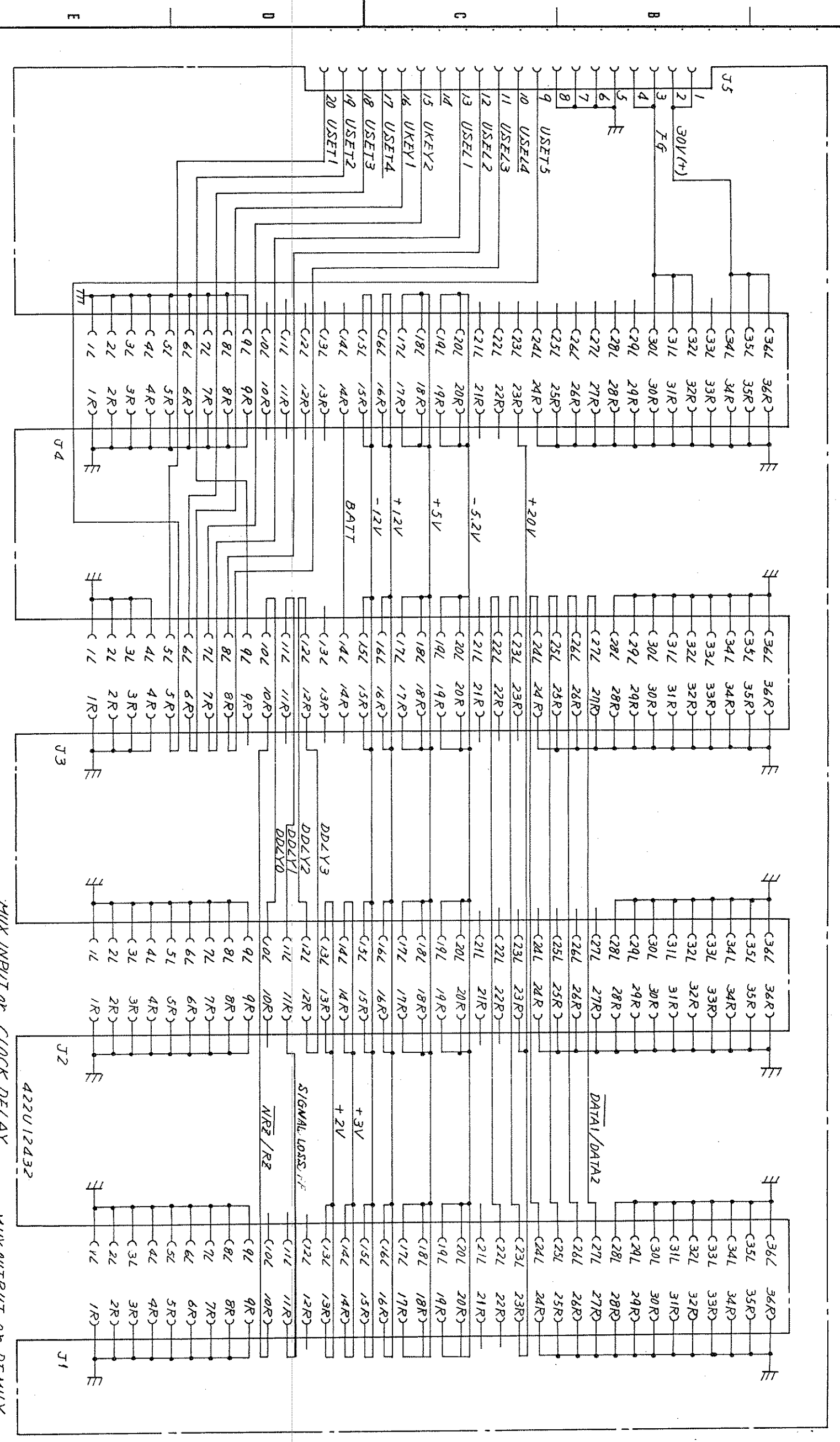
3.5.1 MH676A Z5 Motherboard PC board

2



APPLICATION

REVISIONS



POWER SUPPLY

CONTROL

MUX INPUT or CLOCK DELAY

MUX OUTPUT or DEMUX

DEP

Parts List 44W03354

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------|----------|---------------|----------|--------|
| | | 422U12432 | | |
| | | NR2/R2 | | |
| | | SIGNAL LOSS/F | | |
| | | DDLY2 | | |
| | | DDLY3 | | |
| | | DDLY0 | | |
| | | +3V | | |
| | | +2V | | |
| | | DATA1/DATA2 | | |

TITLE Z5 MOTHER BOARD Circuit Diagram

DRAWING No. 43W33614

2

No. 0023-1985-08

43W33614 1/1

2

3

4

5

6

7

8

ANRITSU CORP.

3-15/3-16

(1) Fuse replacement

Pull the MH676A out from the M5522A Transmitter

and remove the top cover according to the instruc-

tions given in paragraph 2.1.

Remove fuses F1 to F5 from the fuse holder on the Z4 PC board and replace them with new fuses (Fig. 3-4).

(2) Troubleshooting

(a) Disconnect J2 to J11 of the MH676A from J2 to J4 of PC board Z1, Z2 to J6 of PC board Z2 and J1 and J2 of PC board Z3.

(b) Disconnect PC boards Z1 to Z3 from J1 to J3 of PC board Z5.

(c) Remove the PC board Z4 and insert the extender board into where PC board Z4 was mounted.

Then connect Z3 to the extender board.

(d) Use a dc voltmeter to check that the voltage

between Z4 test point ① and the frame ground ② is 35 to 50 V. If the voltage is within this range, go to the next step.

If the voltage is abnormal, troubleshoot the

circuit related to Z4 ① and F9 of the M5522A Transmitter power supply circuit (43W33419 2/2). (Refer to the M5522A service manual.)

(e) Use the dc voltmeter to check that the voltage

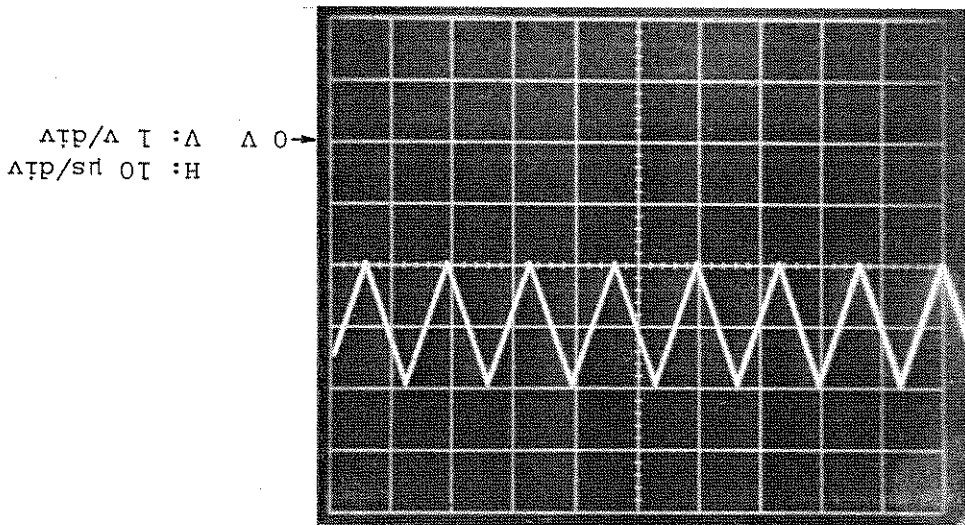
between Z4 test point ② and the frame ground ③ is 12 to 15 V. If the voltage is within this range, go to the next step.

If the voltage is abnormal, troubleshoot the

circuit related to Z4 ②.

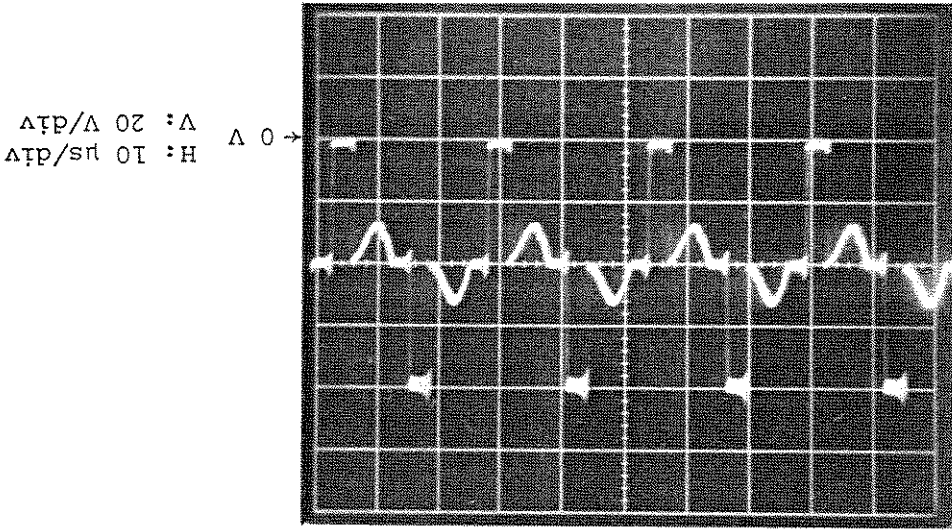
(g) Use an oscilloscope with probe to check the waveform between Z4 test points ④ or ⑤ and ⑥. Figure 3-6 shows the normal waveform. If the waveform is abnormal, go to the next step. If the waveform is abnormal, troubleshoot the circuits related to Z4 ④ and ⑤.

Fig. 3-5 Waveform at MH676A Z4 Test Point ③



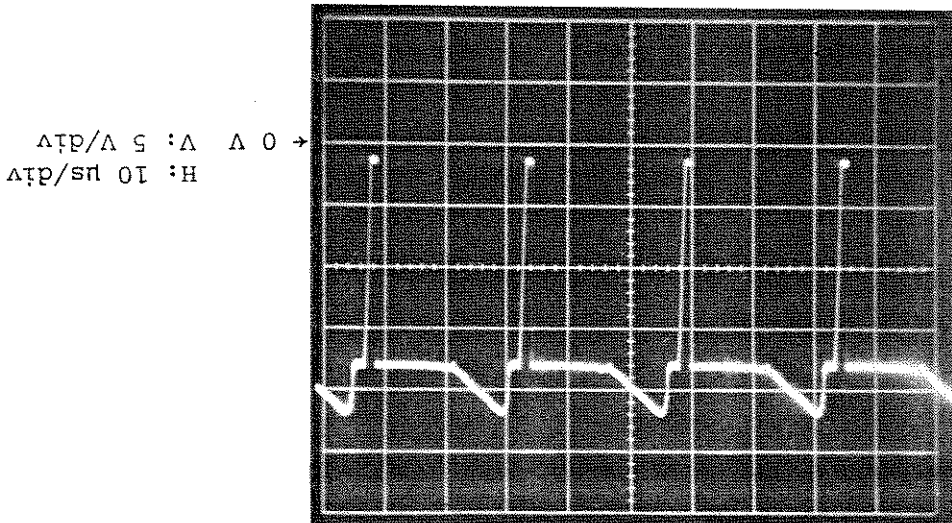
(f) Use an oscilloscope with probe to check the waveform between Z4 test point ③ and the frame ground ⑥. Figure 3-5 shows the normal waveform. If the waveform is normal, go to the next step. If the waveform is abnormal, troubleshoot the circuit related to Z4 ③.

Fig. 3-7 Waveform at MH676A Z4 Test Point ⑥



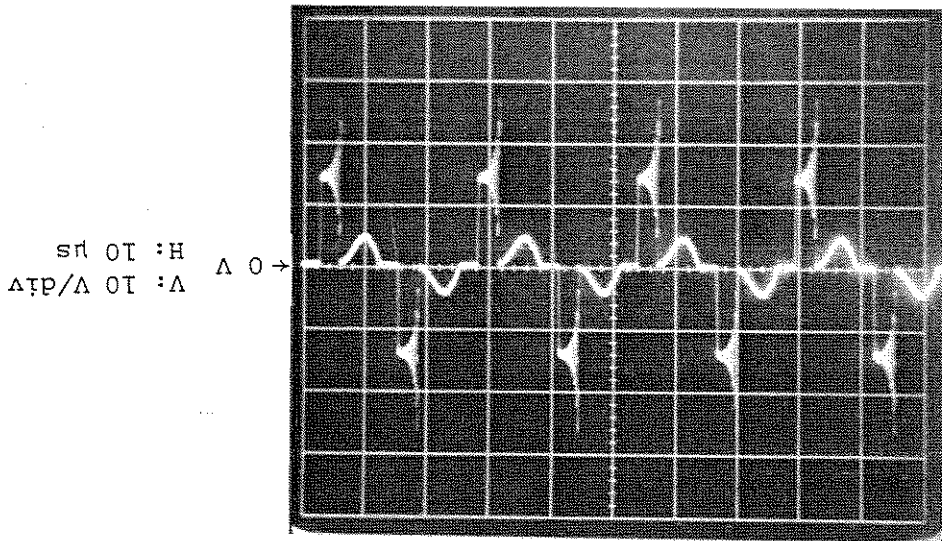
(h) Use an oscilloscope with probe to check the waveform between Z4 test point ⑥ and the frame ground ⑫. Figure 3-7 shows the normal waveform. If the waveform is normal, go to the next step. If the waveform is abnormal, trouble-shoot the circuit related to Z4 ⑥.

Fig. 3-6 Waveform at MH676A Z4 Test Points ④ or ⑤



(j) Use the dc voltmeter to check that the voltage between Z4 test point ⑨ and ground (G) is between -5.15 to -5.25 V. If the voltage is within this range, go to the next step. If the voltage is abnormal, adjust R6 until the voltage between Z4 test point ⑨ and ground (G) is -5.2 V. If the voltage cannot be corrected, troubleshoot the circuits related to Z4 ⑦ and ⑨ and R6.

Fig. 3-8 Waveform at MH676A Z4 Test Point ⑦



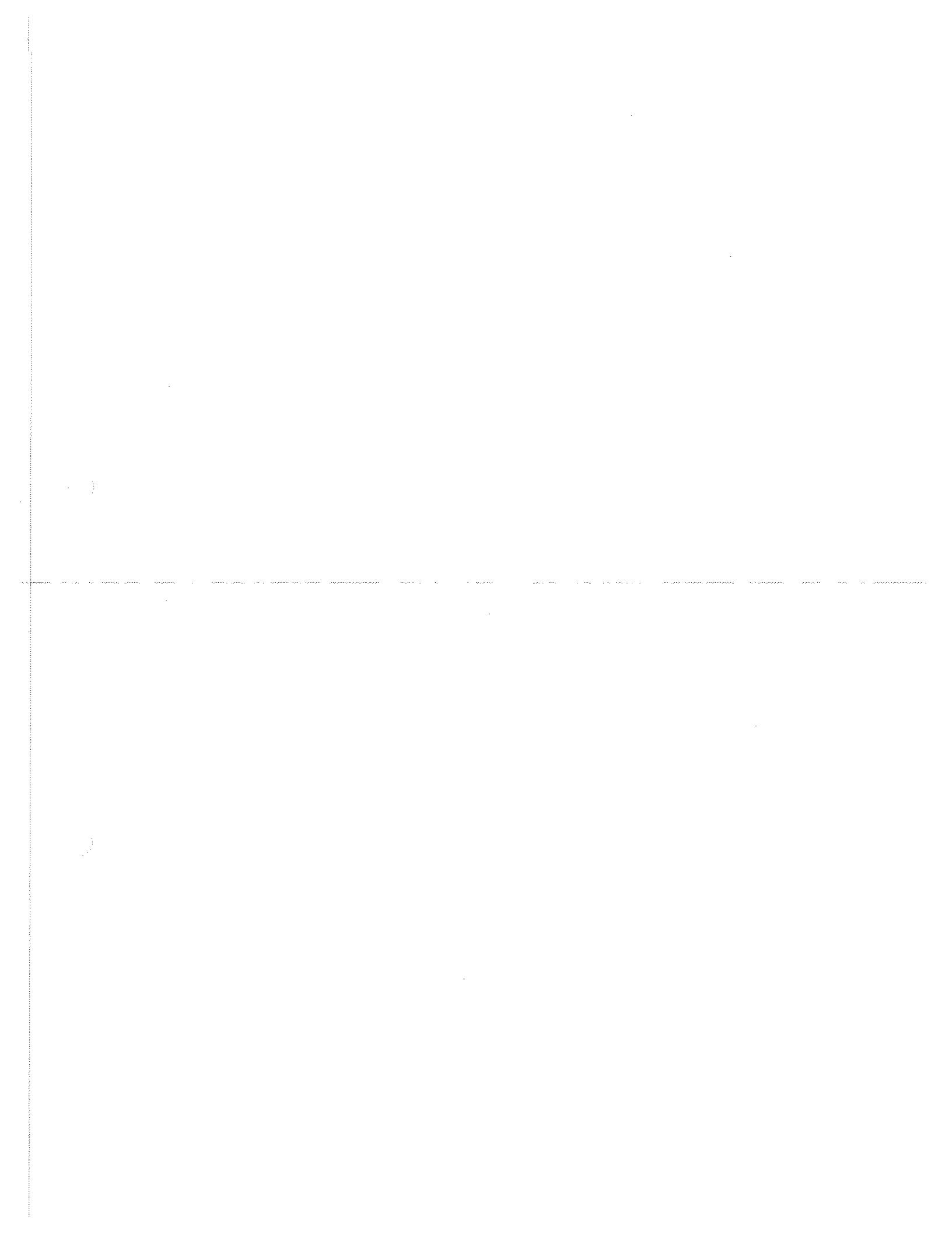
(i) Use an oscilloscope with probe to check the waveform between Z4 test point ⑦ and the ground ⑦. Figure 3-8 shows the normal waveform. If the waveform is normal, go to the next step. If the waveform is abnormal, troubleshoot the circuit related to Z4 ⑦.

The above table lists the normal values. If the voltage is not within these ranges, troubleshoot the circuits from T3 to ⑧, ⑩, ⑪, ⑫ and near the test point ⑨.

| | |
|---|------------------|
| ⑧ | +5.5 V to +6.5 V |
| ⑩ | +11 V to +13 V |
| ⑪ | -11 V to -13 V |
| ⑫ | +18.5 to +20.5 V |
| ⑬ | +3.2 to +4 V |

Table 3-5 Voltages at Test Points ⑧ and ⑩ to ⑬

(k) Use the dc voltmeter to check the voltage between ⑧, ⑩, ⑪, ⑫, ⑬ and ground (G). ⑭.



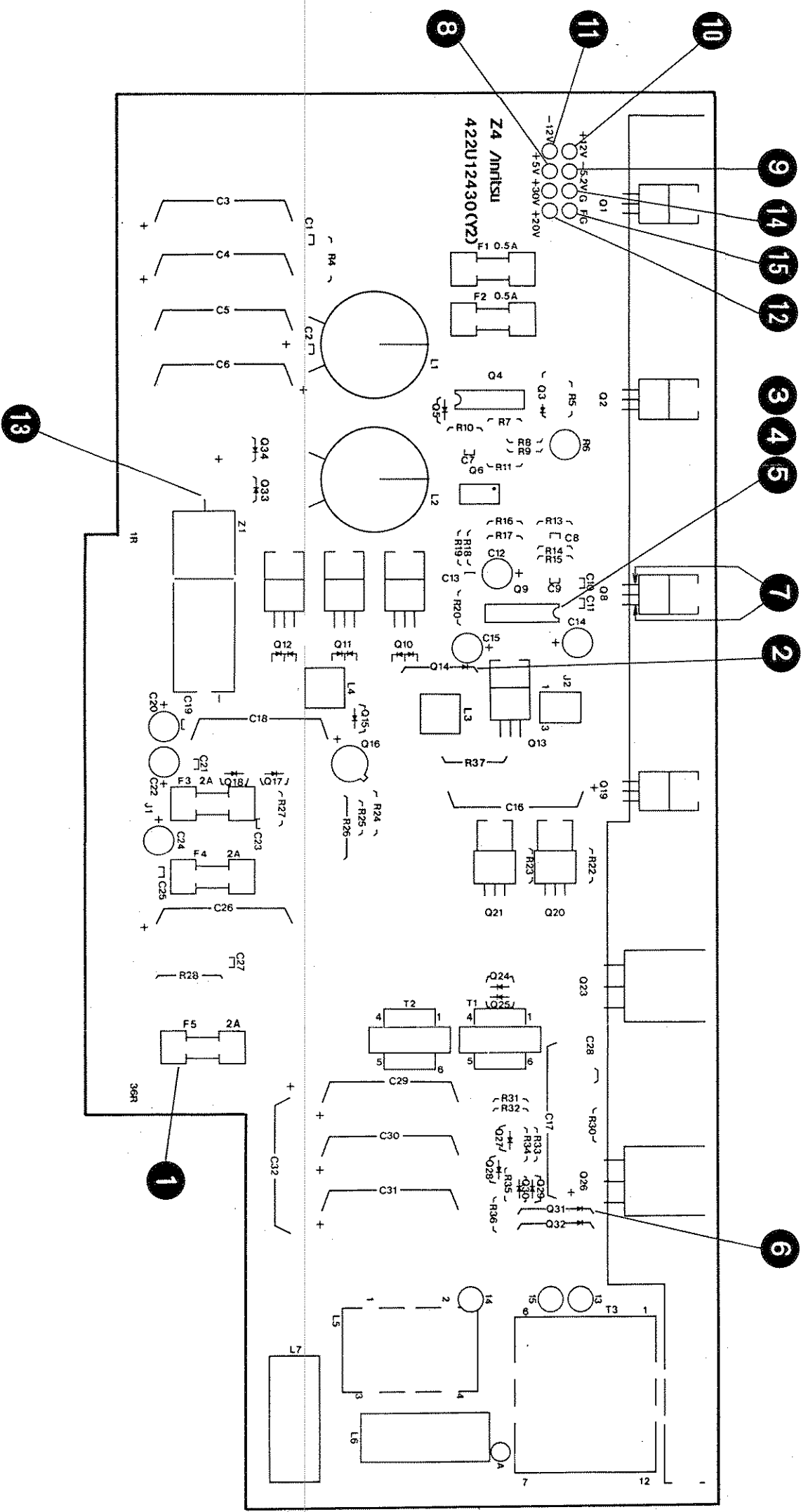
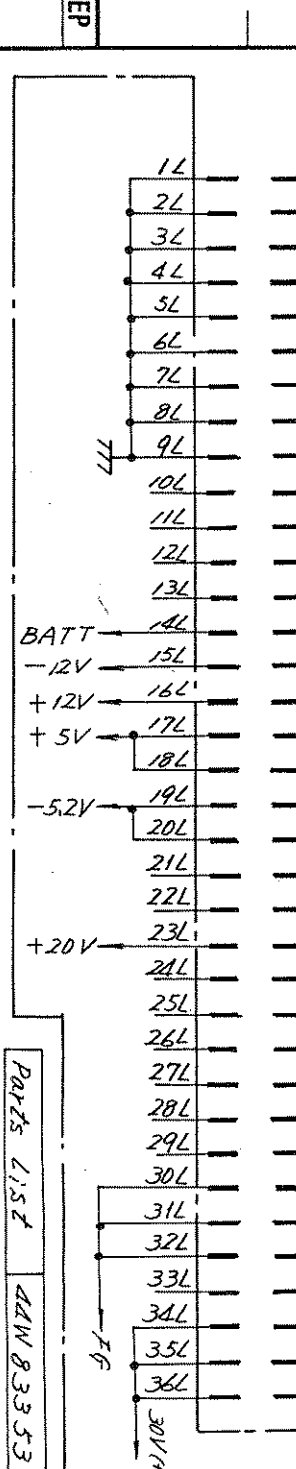
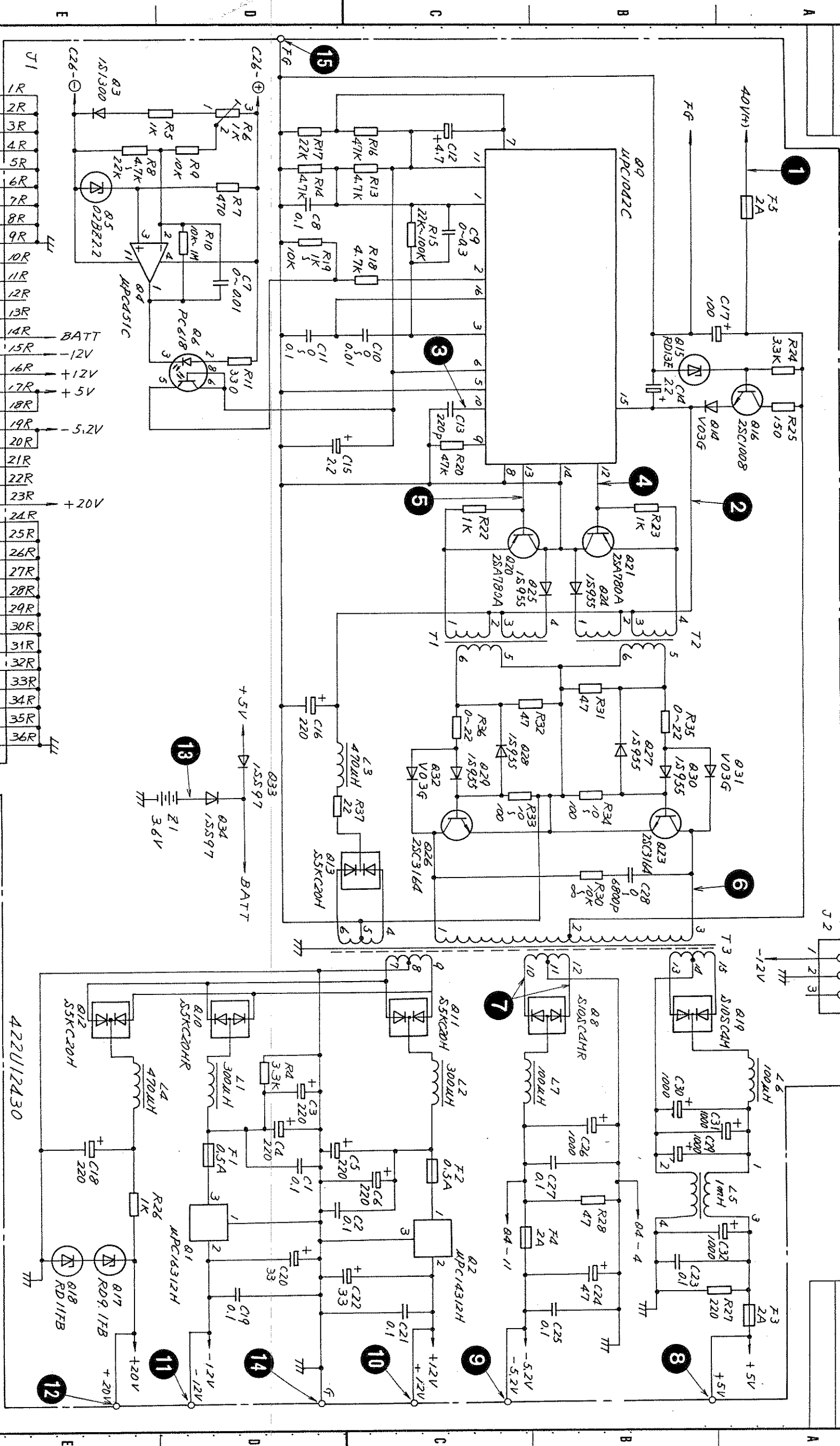


Fig. 3-9
 Parts Layout of MH676A Z4
 Power Supply PC Board **3**
 3-23/(3-24 blank)



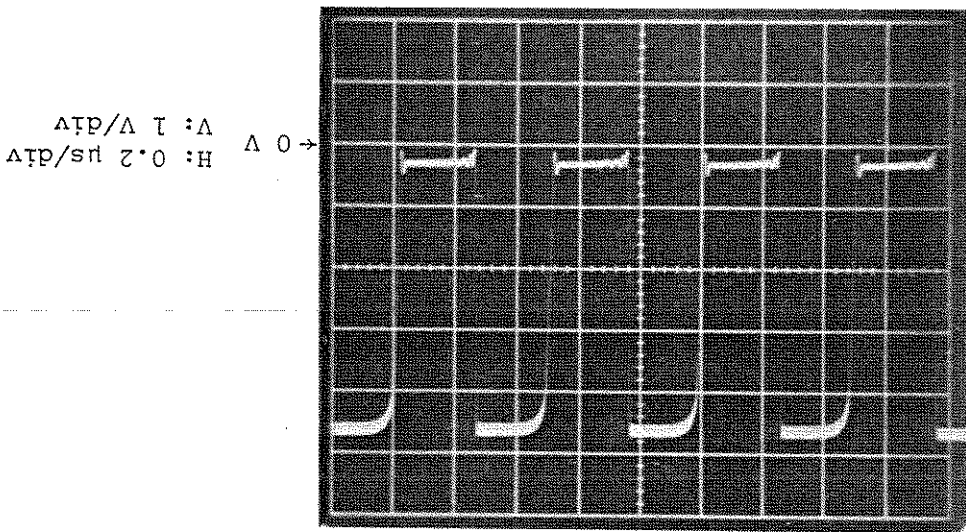
| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|---------------------------------|----------|-------------|----------|--------|
| | APPROVED BY: <i>Maguenderic</i> | | | | |
| | CHECKED BY: | | | | |
| | TRACED BY: | | | | |
| | DRAWN BY: <i>Maguenderic</i> | | | | |
| | SCALE: 1 | | | | |
| | DRAWING No. 43W33613 | | | | |
| 3 | | | | | |

TITLE
Z4 POWER SUPPLY Circuit Diagram

DRAWING No. 43W33613

If the signal waveform is normal, go to the next step. If the signal waveform is abnormal, troubleshoot the circuit related to Z3 ①.

Fig. 3-10 Waveform at Z3 Test Point ①



- 3-10.
- (a) Remove the PC board Z3 and insert the extender board into where PC board Z3 was mounted. Then connect Z3 to the extender board. At this time, J2 of Z3 is open.
 - (b) Turn the power on with the MH676A LOCAL CONTROL key held down. The MH676A control circuit is then initialized.
 - (c) Use an oscilloscope to check that the signal waveform at Z3 test point ① is as shown in Fig. 3-10.

The above table lists the standard voltages. The tolerance range is $\pm 10\%$. If all voltages are normal, no troubleshooting is required.

1. If the voltage at ⑩ is abnormal, troubleshooting the circuit for Q45.
2. If the voltages at ⑥ and ⑦ are abnormal, troubleshooting the circuits for Q10, Q11, Q6, and Q12.
3. If the voltages at ⑧ and ⑨ are abnormal, troubleshoot the circuits for Q15, Q16, Q17, and Q12.

| Setting | CLOCK and DATA OFFSET | CLOCK and DATA MULTITUDE |
|---------|-----------------------|--------------------------|
| ⑩ | -1 V | 3 V |
| ⑨ to ⑥ | 0.4 V | 1 V |
| ⑩ | 0.4 V | 2.5 V |
| ⑩ | 2 V | 1.25 V |

Table 3-6 Standard Values at Z3 Test Points ⑥ to ⑩

(d) Use an oscilloscope to check that the levels at Z3 test points ②, ③, and ④ are high (+3 to +5.5 V). If the levels are within this range, go to the next step. If the levels are abnormal, troubleshoot the circuit for Z3 test points ②, ③, and ④.

(e) Measures the voltages at Z3 test points ⑥ to ⑩ with the panel set as follows:

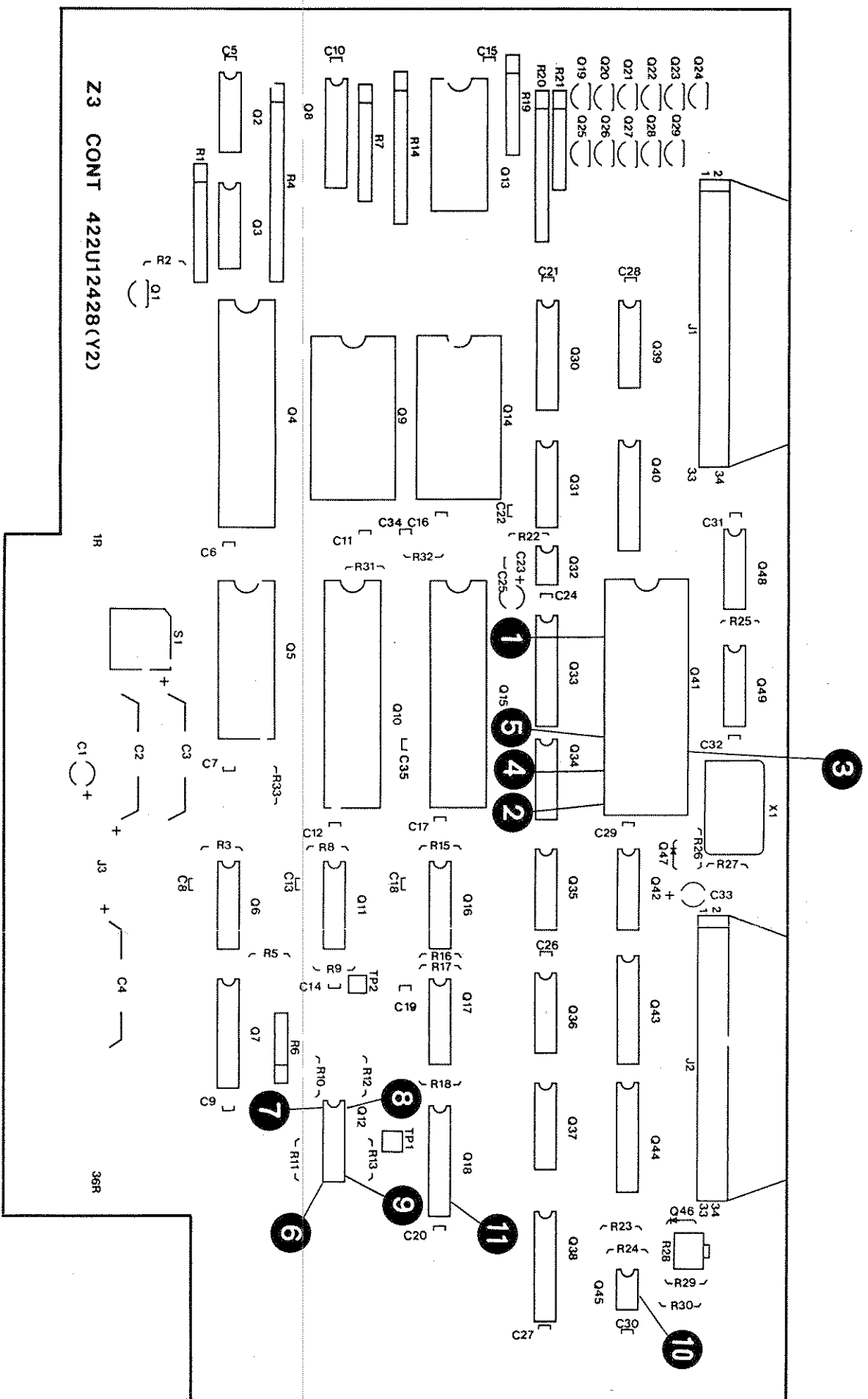
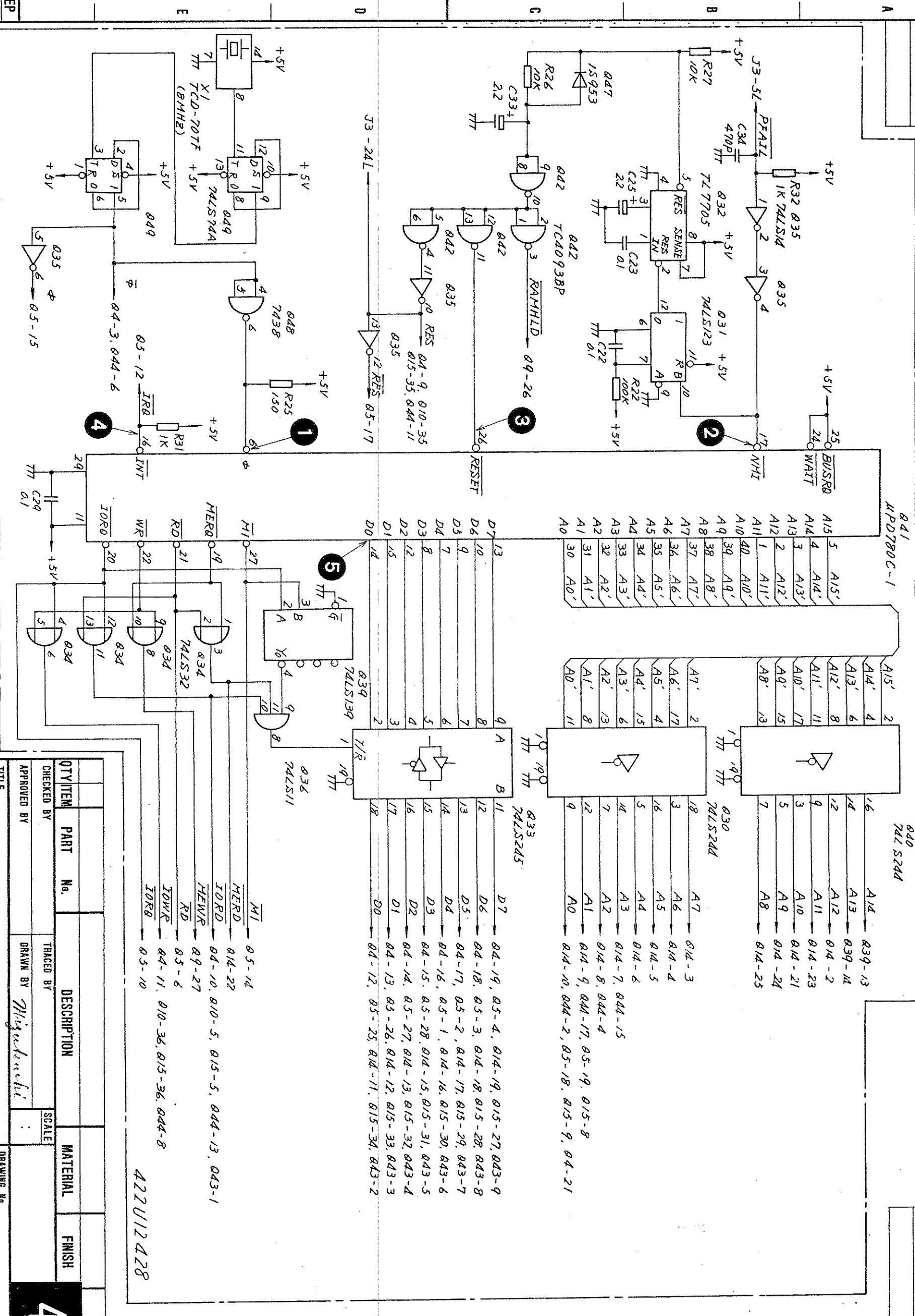


Fig. 3-11
 Parts Layout of MH676A Z3
 Control PC Board **4**
 3-29/(3-30 blank)

APPLICATION

REVISIONS



DEP

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

APPROVED BY _____
 CHECKED BY _____
 TRACED BY _____
 DRAWN BY *Miguchuki*

TITLE
Z3 CONTROL Circuit Diagram

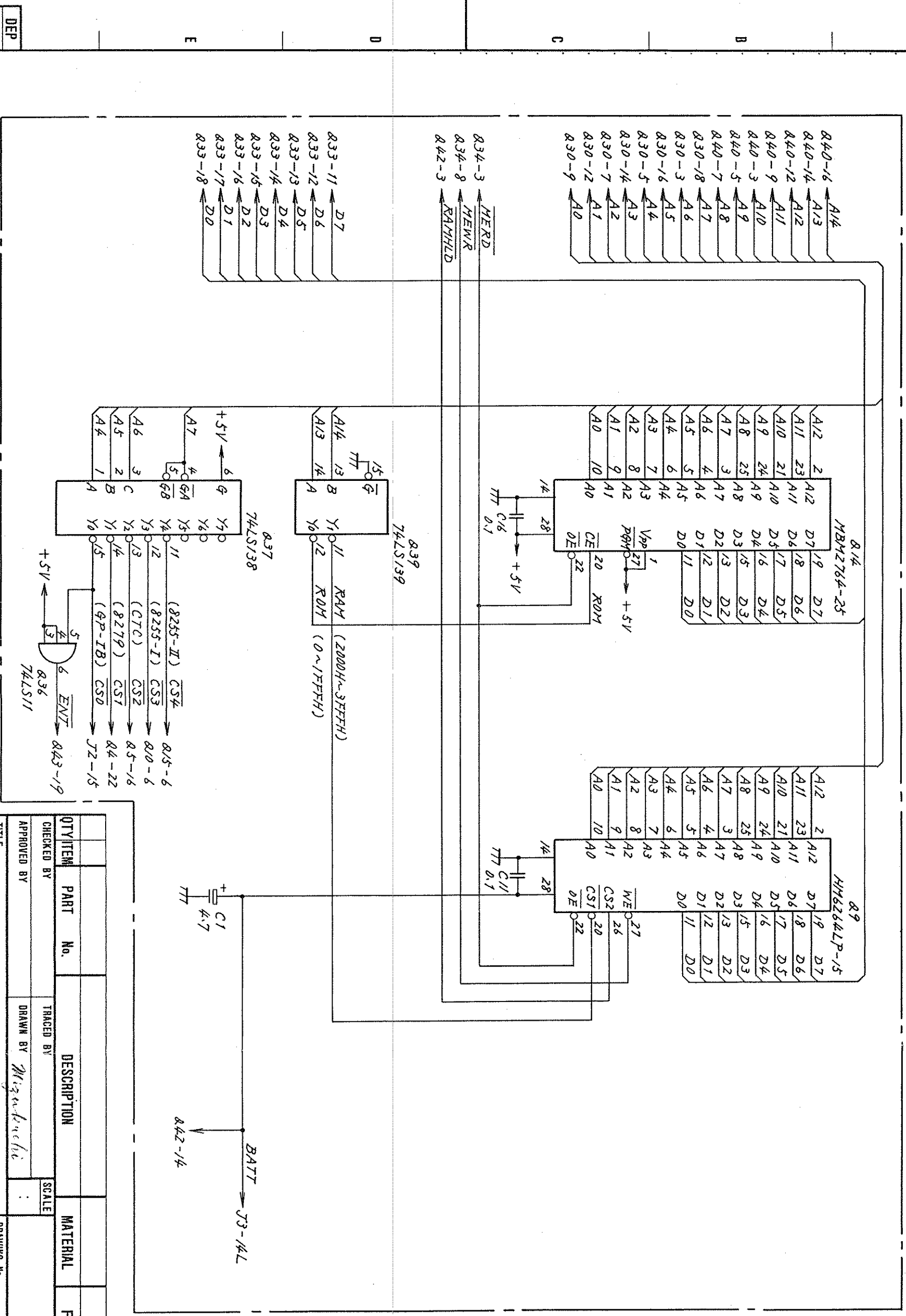
SCALE
 DRAWING No. **43W33612**

No. 0023-1985-08
 43W33612 1/6
 1 2 3 4 5 6 7 8
ANRITSU CORP.
 3-31/3-32

43W33612 1/6

ANRITSU CORP.

3-31/3-32



| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-------------|----------|-------------|----------|--------|
| | | | | |
| CHECKED BY | | TRACED BY | | |
| APPROVED BY | | DRAWN BY | | |
| | | SCALE | | |
| TITLE | | DRAWING No. | | |

Z3 CONTROL Circuit Diagram.

43W33612 2/6

4

No. B023-1985, 08

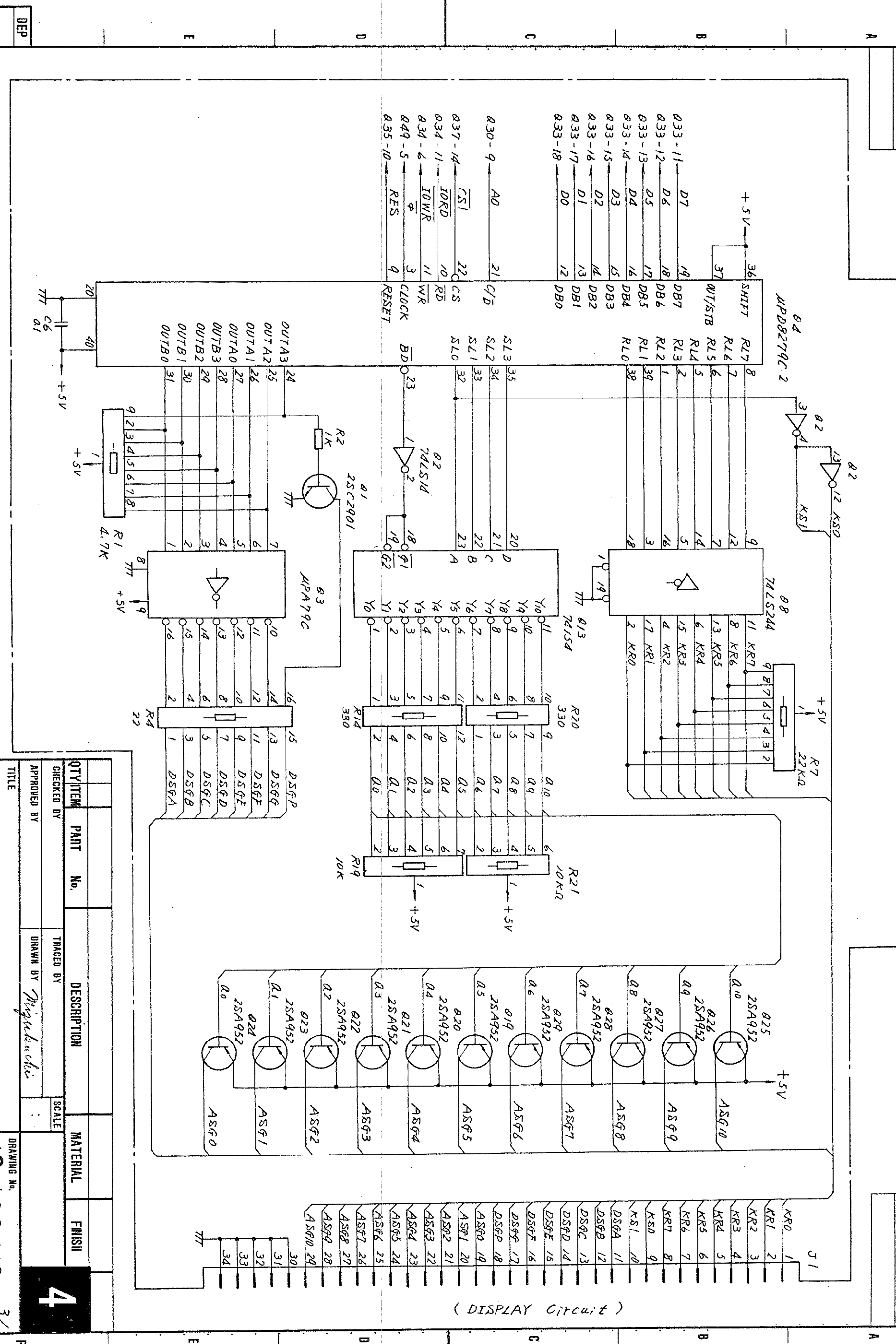
43W33612 2/6

ANRITSU CORP.

3-33/3-34

APPLICATION

REVISIONS



(DISPLAY circuit)

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

CHECKED BY: _____ TRACED BY: *Miyakubo* SCALE: _____

APPROVED BY: _____ DRAWN BY: *Miyakubo* TITLE: **Z3 CONTROL Circuit Diagram** DRAWING No. **43W33612**

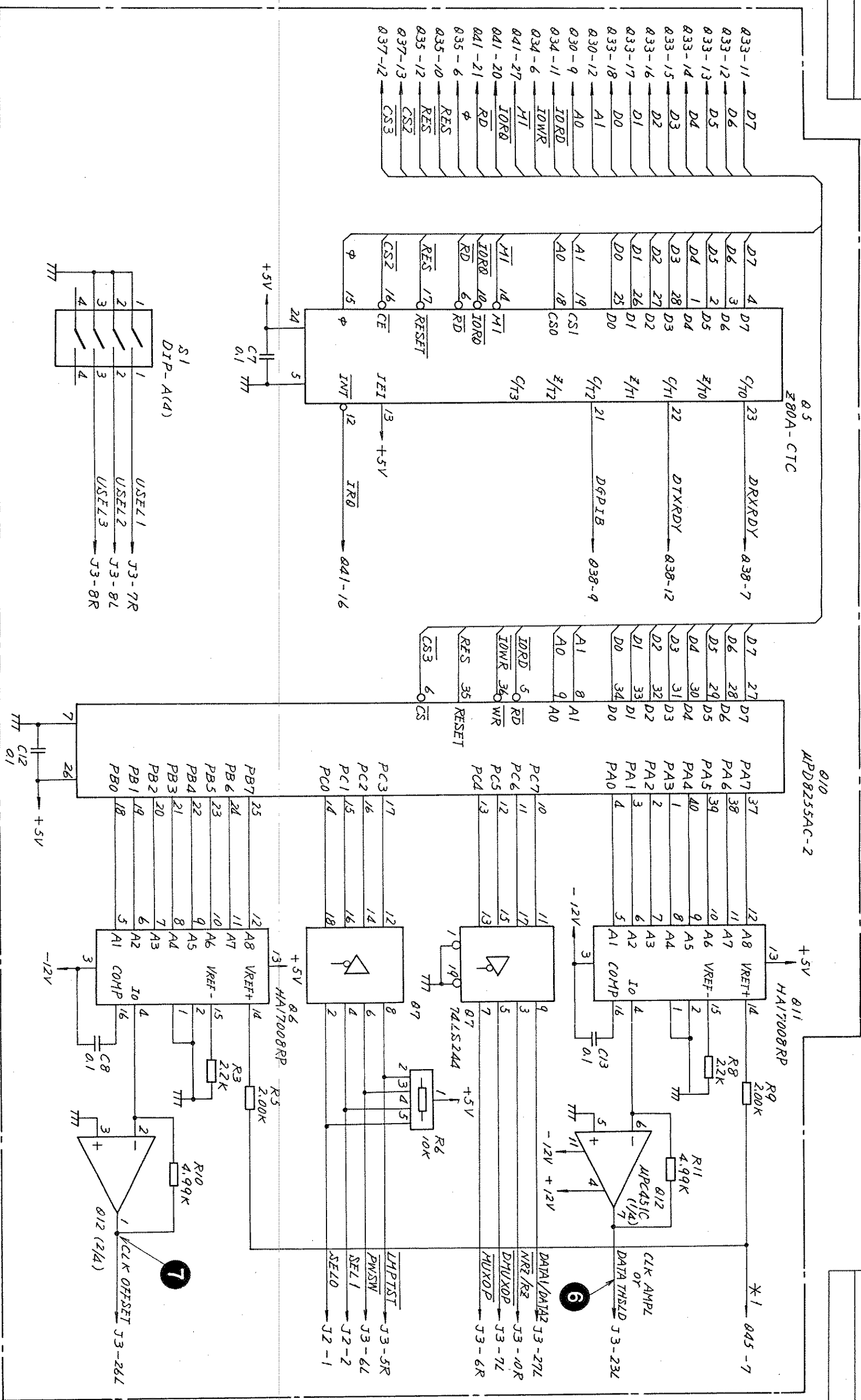
4

No. 0023-1985-08 1 2 3 4 5 6 7 8 **43W33612** 3/6

ANRITSU CORP. 3-35/3-36

APPLICATION

REVISIONS



Note: Switch S1 Setting

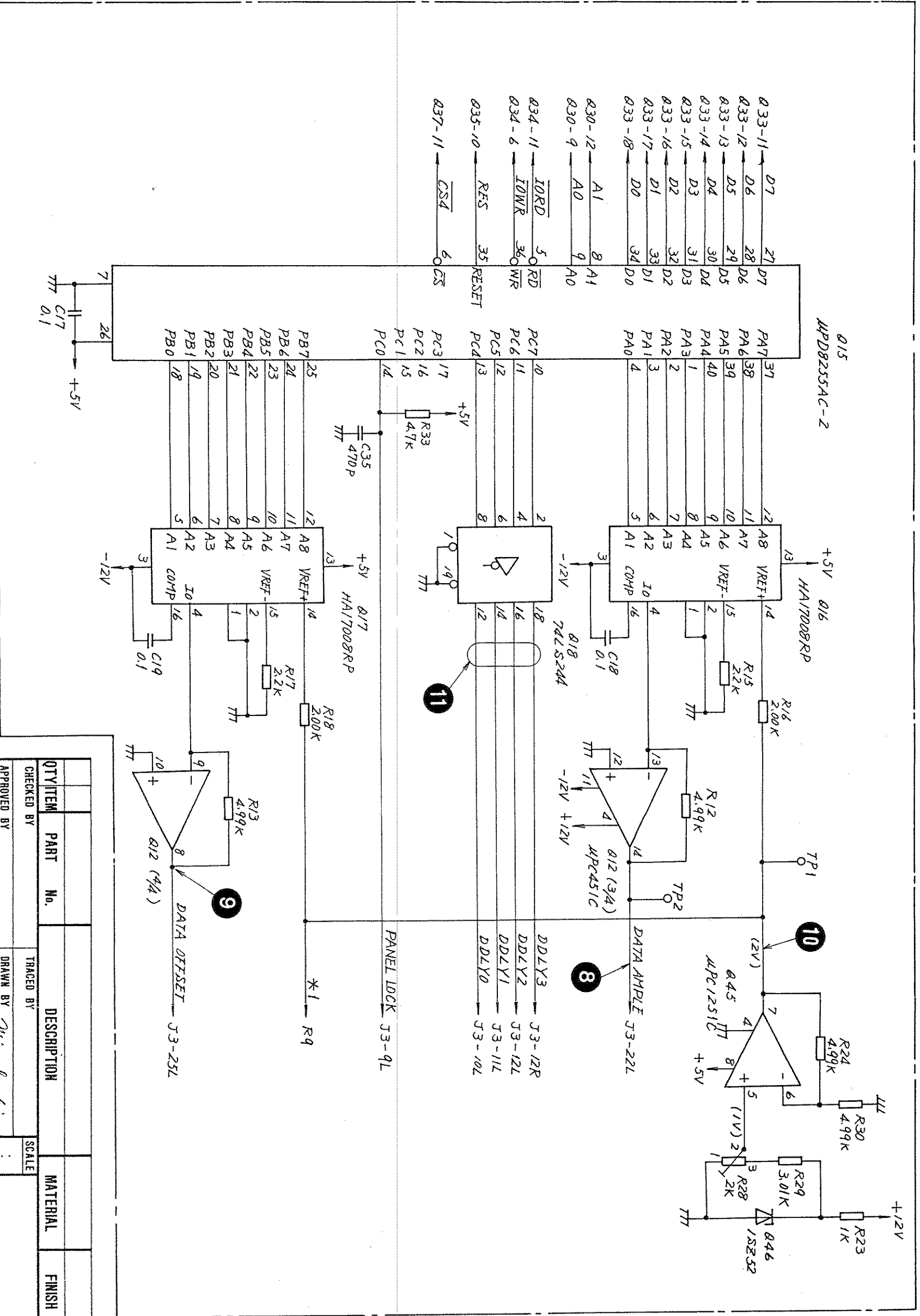
| Unit | S1 Switch NO | 1 | 2 | 3 |
|---------|--------------|-----|-------|----|
| MH 676A | | ON | ON | ON |
| MH 677A | | OFF | ON | ON |
| | USEL1 | | J3-7R | |
| | USEL2 | | J3-8L | |
| | USEL3 | | J3-8R | |

DEP

| | | | | | |
|-----|------|----------|-------------|----------|--------|
| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| | | | | | |

CHECKED BY: _____ TRACED BY: _____
 APPROVED BY: _____ DRAWN BY: *Miguelkachs*
 TITLE: *Z3 CONTROL Circuit Diagram*
 DRAWING No.: **43W33612**
 3-37/3-38

| | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|
| No. 0023-1985,08 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43W33612 | | | | | | | | |
| 4/6 | | | | | | | | |



DEP

| | | | | | | | | |
|------------------|-----|---|---|---|---|---|---|---|
| No. 0023-1985-08 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43W33612 | 5/6 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

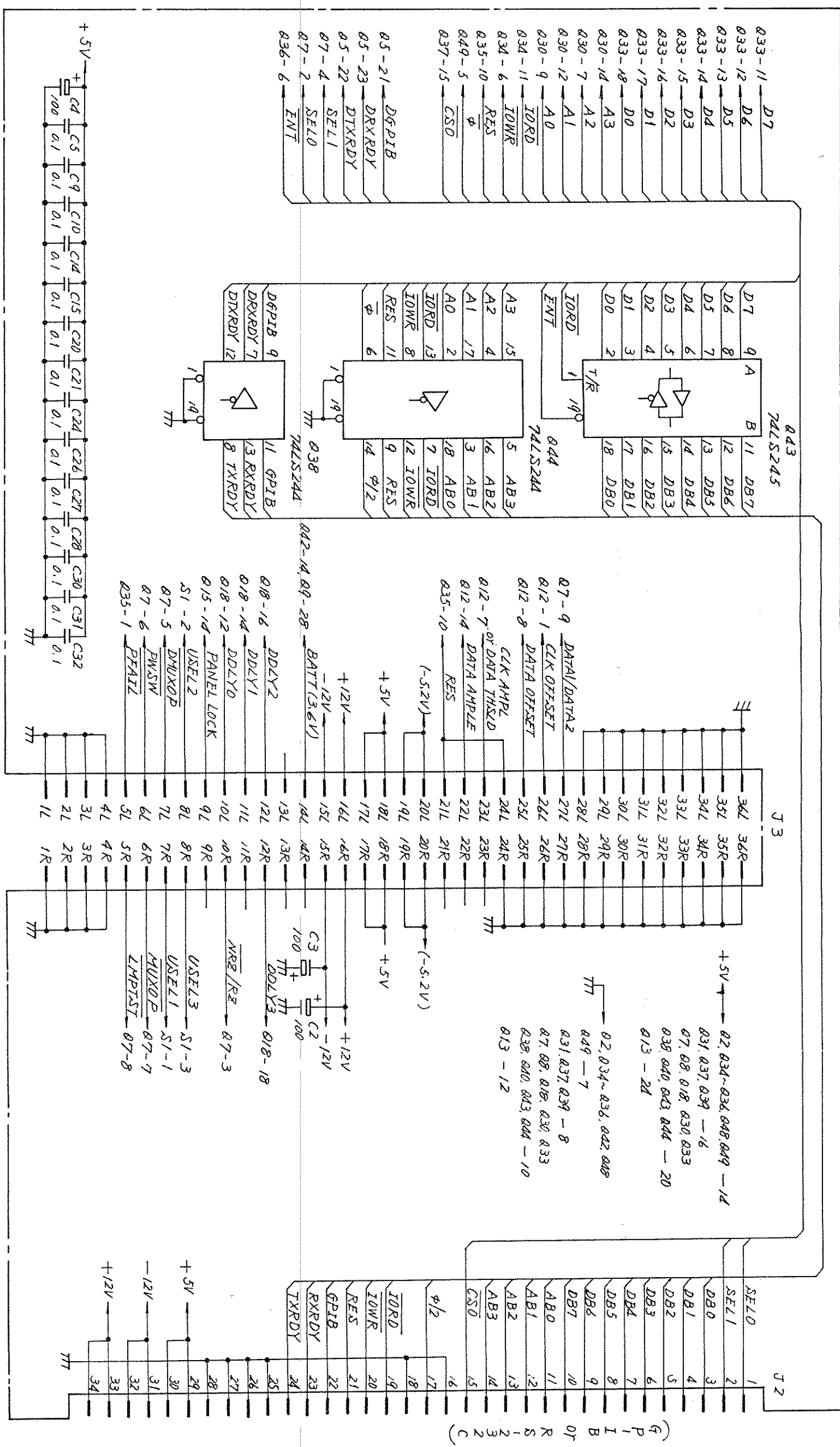
| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------------------------|-----------|-------------|----------|--------|
| CHECKED BY | TRACED BY | SCALE | | |
| APPROVED BY | DRAWN BY | DRAWING No. | | |
| TITLE | | DRAWING No. | | |
| Z3 CONTROL Circuit Diagram | | 43W33612 | | |
| | | 3-39/3-40 | | |

4

ANRITSU CORP.

APPLICATION

REVISIONS



| | | | | | | | | | | | | | | | | | |
|----------------------------|--|----------|--|-------------|--|-------------|--|--------|--|----------|--|--------------|--|-----------|--|-------------|--|
| No. 0023-1985-08 | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | |
| 43W33612 6/6 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | |
| DEP | | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | |
| TITLE | | PART No. | | DESCRIPTION | | MATERIAL | | FINISH | | SCALE | | DRAWING No. | | DATE | | DRAWN BY | |
| Z3 CONTROL Circuit Diagram | | | | MAGNIFICENT | | | | | | 4 | | 43W33612 6/6 | | 3-41/3-42 | | MAGNIFICENT | |
| CHECKED BY | | DRAWN BY | | SCALE | | DRAWING No. | | DATE | | DRAWN BY | | DATE | | DRAWN BY | | DATE | |
| | | | | | | | | | | | | | | | | | |

ANRITSU CORP.

(1) Circuit description

Figure 3-12 shows the Z2 Multiplexer input circuit block diagram. This circuit receives DATA1, DATA2, and CLOCK signals from the M552A Transmitter. These signals pass through the pulse shaper. The DATA1 and DATA2 signals are AND-gated with the CLOCK and clock (reverse polarity) signals and are converted into two RZ signals. After passing through the pulse shaper, the RZ signals are converted into DATA output signals by OR-gating. The output signal speed is twice the input data signal speed.

The CLOCK signal passes through the pulse shaper and is branched into the CLOCK and clock signals. The two signals are differentiated and OR-gated.

The OR-gated signal passes through the variable high-pass and low-pass filters controlled by the frequency-to-voltage converter (explained later), and is converted into a frequency signal that is twice as fast as the input CLOCK signal.

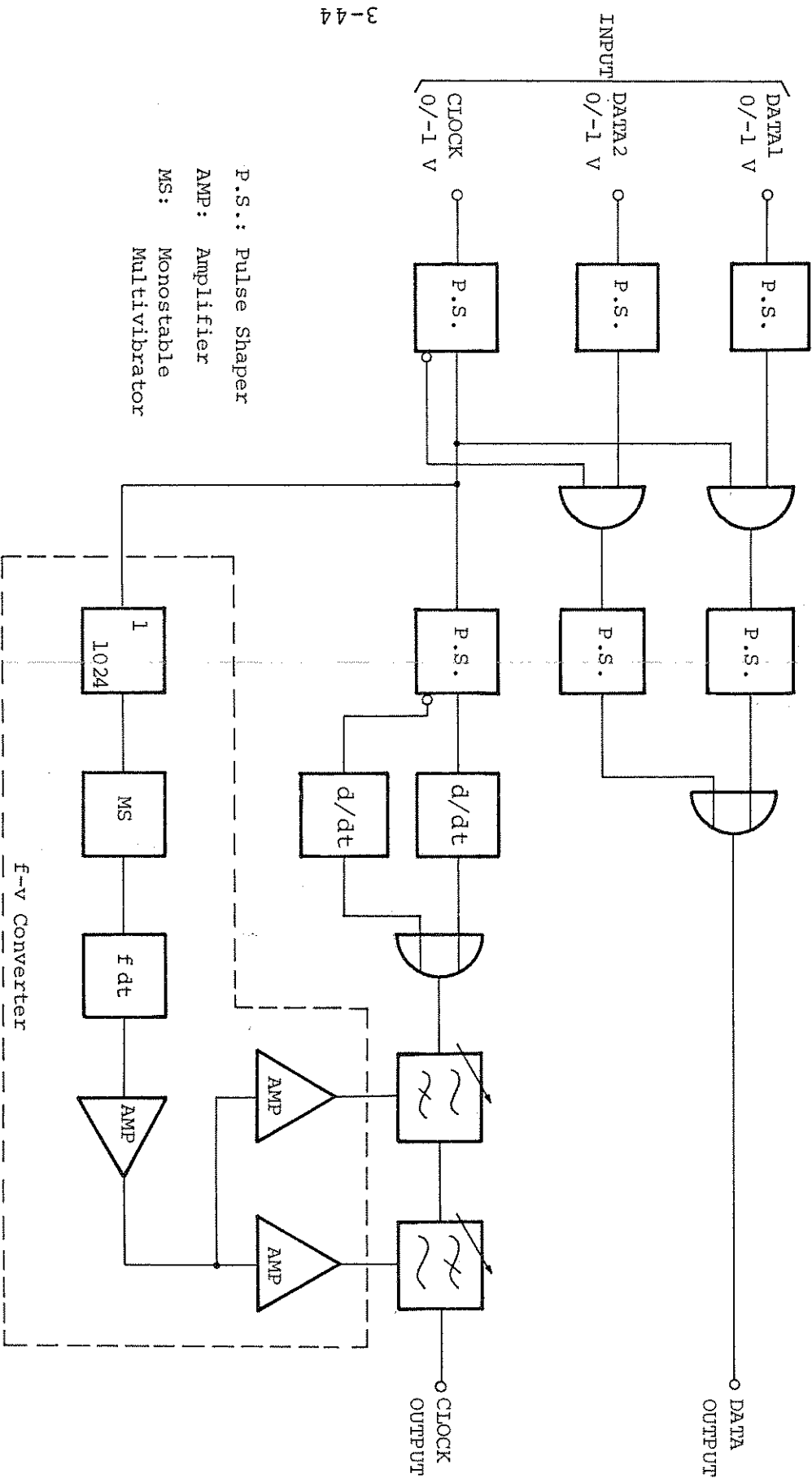


Fig. 3-12 MH676A Z2 MUX INPUT Block Diagram

Turn the power on with the LOCAL key held down to initialize the MH676A.

- 2. MH676A
 - LOGIC : Normal
 - LOAD : 50 Ω
 - PATTERN : PRBS 2²³
 - Frequency: 350 MHz
- 1. ME522A Transmitter

(b) Setting ME522A Transmitter and MH676A

waveforms.
 terminal of ME522A Transmitter, and observe the sampling oscilloscope to the CLOCK SYNC OUTPUT
 Connect the EXTERNAL TRIG INPUT terminal of a
 P-RG58A/U SMA-P 1 m coaxial cable)
 (BNC-P to SMA-J) conversion connector and SMA-
 using cables of the same length.

Then, connect the DATA, DATA2, and CLOCK 2
 OUTPUT terminals of the ME522A Transmitter to J2,
 J3, and J5 respectively of the MH676A PC board Z2

Remove PC board Z2, insert the extender board
 into the Z2 PC board position and connect Z2 to
 it.
 of PC board Z2.

(a) Disconnect all connectors connected to J2 to J6

(2) Troubleshooting

The f-v converter divides the CLOCK signal by
 1/1024 and the multiplier converts the pulse width
 into a fixed value. Then the signal is converted into
 a dc voltage through the integrator.

- (c) Use the sampling oscilloscope with probe (MP671A) to check the waveform and phase at Z2 test points ① and ②.
- If they are as shown in Fig. 3-13, go to the next step. If they are abnormal, follow the instructions below.
1. If the waveform at ① is abnormal, trouble-shoot the circuits for J2, Q2, Q4, and Q5, and the peripheral circuits.
 2. If the waveform at ② is abnormal, trouble-shoot the circuits for J5, Q35, Q37, and Q49, and the peripheral circuits.
 3. If the phase relationship between ① and ② is abnormal, check the input phase relationship between the DATA1 and CLOCK signals. If this relationship is also abnormal, troubleshoot the ME522A Transmitter for the DATA and CLOCK signal output phases.

(d) Use the sampling oscilloscope with probe (MP671A) to check the waveform and phase at Z2 test points ③ and ④. If they are as shown in Fig. 3-14, go to the next step. If they are abnormal, follow the instructions below.

1. If the waveform at ③ is abnormal, trouble-shoot the circuits for J3, Q21, Q23, and Q24, and the peripheral circuits.

2. If the waveform at ④ is abnormal, trouble-shoot the circuits for J5, Q35, Q37, and Q28, and the peripheral circuits.

Fig. 3-13 Waveforms at Z2 Test Points ① and ②

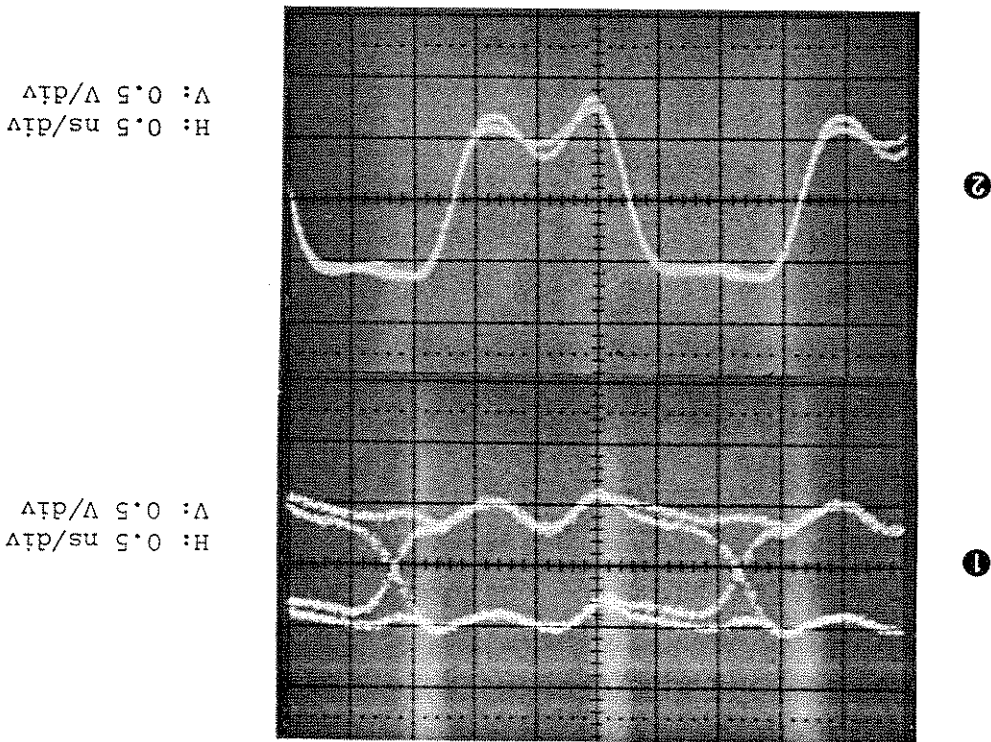
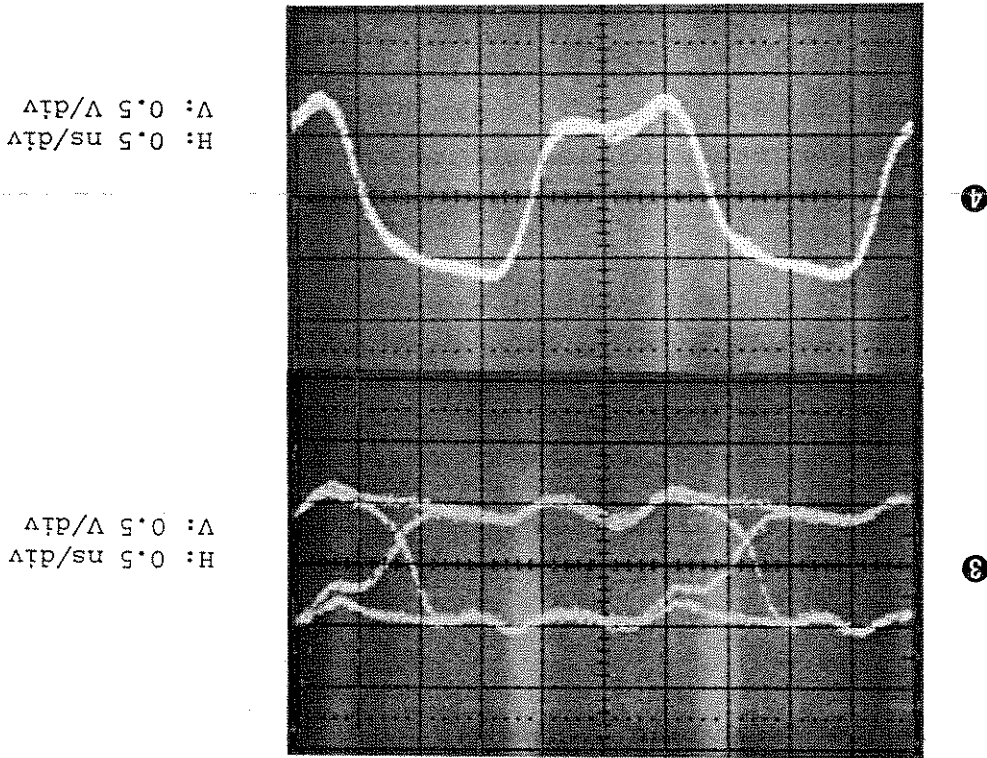
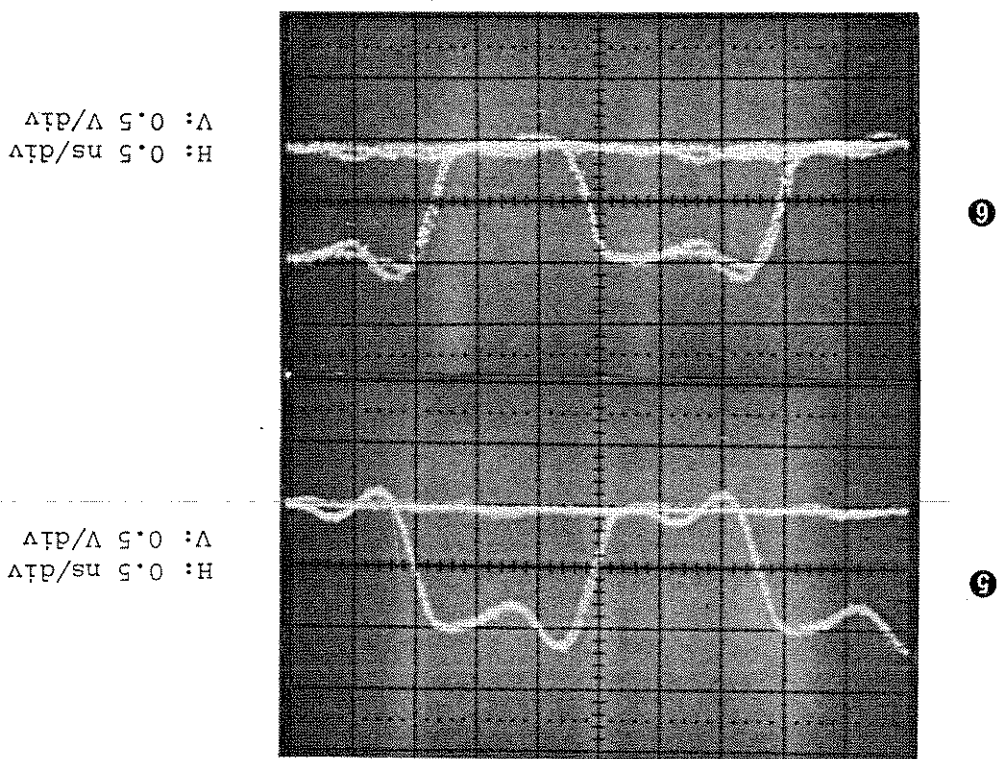


Fig. 3-14 Waveforms at Z2 Test Points ③ and ④



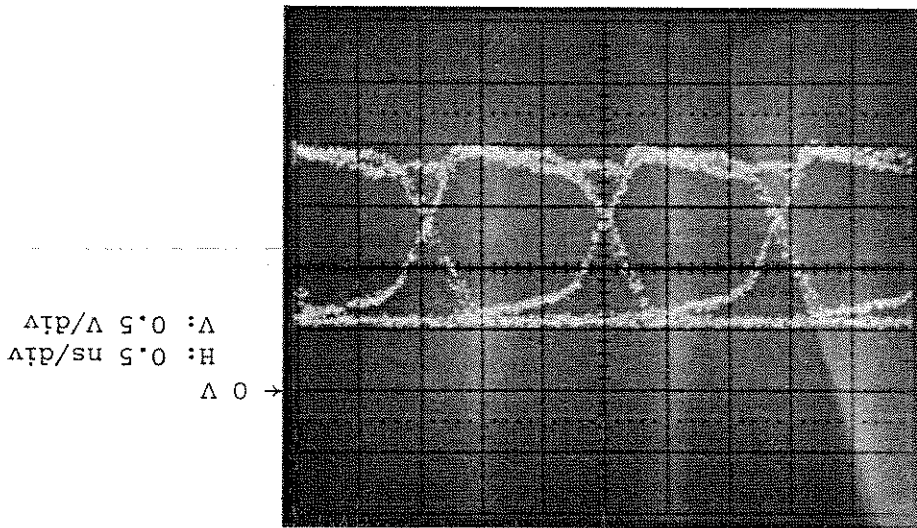
3. If the phase relationship between ③ and ④ is abnormal, check the input phase relationship between the DATA2 and CLOCK signals. If this relationship is also abnormal, troubleshoot the ME522A Transmitter for the DATA and CLOCK signal output phase.

Fig. 3-15 Waveforms at Z2 Test Points ⑤ and ⑥



- (e) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test points ⑤ and ⑥ .
- If they are as shown in Fig. 3-15, go to the next step. If they are abnormal follow the instructions below.
1. If the waveform at ⑤ is abnormal, trouble-shoot the circuits for Q8 and Q13, and peripheral circuits.
 2. If the waveform at ⑥ is abnormal, trouble-shoot the circuits for Q27 and Q32, and peripheral circuits.

Fig. 3-16 Waveform at Z2 Test Point ⑦



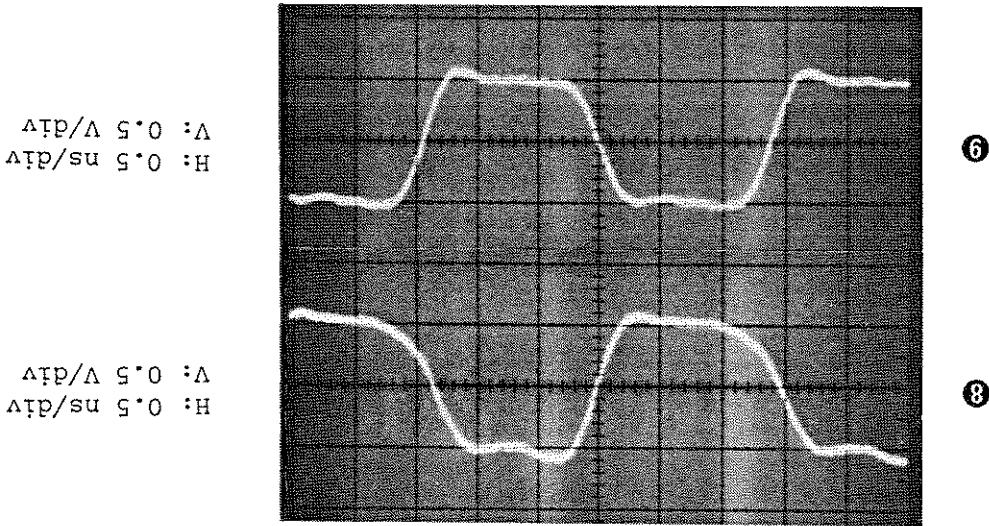
(F) Use a coaxial cable to connect the sampling oscilloscope to J4 and check the waveform at Z2 test point ⑦. Figure 3-16 shows the standard waveform.

If the waveform at ⑦ is abnormal, trouble-shoot the circuits for Q15, Q16, Q18, and Q17, and the peripheral circuits.

R45 and R68 are variable resistors used to adjust the Q16 and Q17 gate bias. R47 and R65 are used to correct changes in the pattern signal mark rate, do not touch them.

(h) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑩. If the waveform is as shown in Fig. 3-18, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q48 to Q53, and the peripheral circuits.

Fig. 3-17 Waveform at Z2 Test Points ⑧ and ⑨



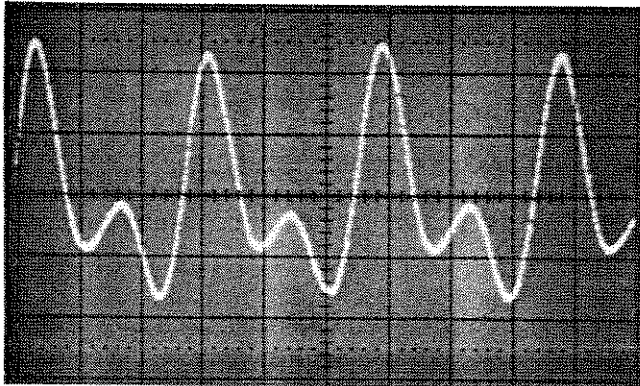
(g) Use the sampling oscilloscope with probe (MP671A) to check the waveforms at Z2 test points ⑧ and ⑨. If they are as shown in Fig. 3-17, go to the next step. If they are abnormal, troubleshoot the circuits for Q35, Q37, and Q39, and the peripheral circuits.

(j) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑩. If the waveform is as shown in Fig. 3-19, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q40 and Q43, and the peripheral circuits.

(i) Use a dc voltmeter to measure the voltage at Z2 test point ⑩ and check that it is from 4.9 to 5.1 V when clock signals are generated, and from 0 to 0.1 V when no clock signals are generated. If the voltage is normal, go to the next step. If the voltage is abnormal, troubleshoot the circuits for Q40, Q43, and Q46, and the peripheral circuits.

⑩ Fig. 3-18 Waveform at Z2 Test Point

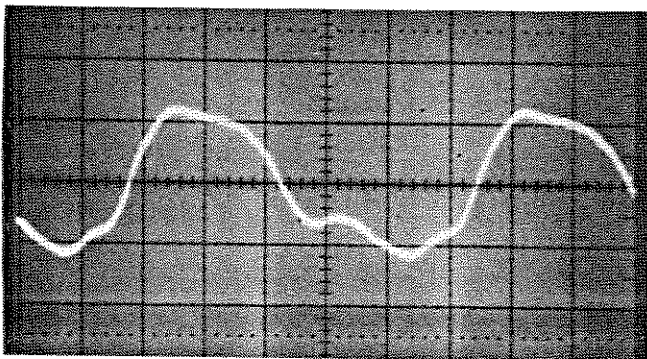
H: 0.5 ns/div
V: 0.5 V/div



(k) Use an oscilloscope with probe to check the waveforms at Z2 test points ⑬ and ⑭. If they are as shown in Fig. 3-20, go to the next step. If they are abnormal, troubleshoot the circuits for Q57 to Q59, Q61, Q62, Q65, and Q66, and the peripheral circuits. ⑮ indicates the frequency generated by dividing the input CLOCK signal frequency by 1/1024.

Fig. 3-19 Waveform at Z2 Test Point ⑰

H: 0.5 ns/div
V: 0.5 V/div

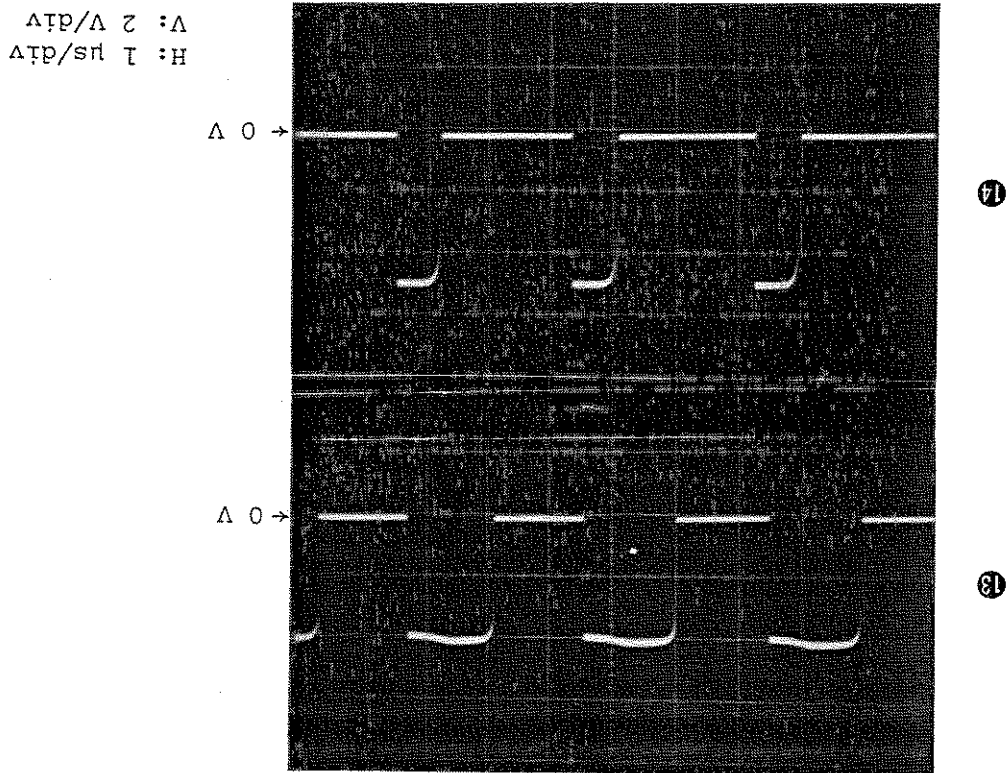


| Input CLOCK signal frequency | 15 | 16 | 17 |
|------------------------------|----------------|----------------|----------------|
| 700 MHZ | +2.2 to +2.5 V | +12 to +14 V | +16 V to +19 V |
| 350 MHZ | -0.3 to -0.6 V | +1.1 to +1.5 V | +1.2 to +1.6 V |

Table 3-7 DC Voltages at Z2 Test Points 15, 16, and 17

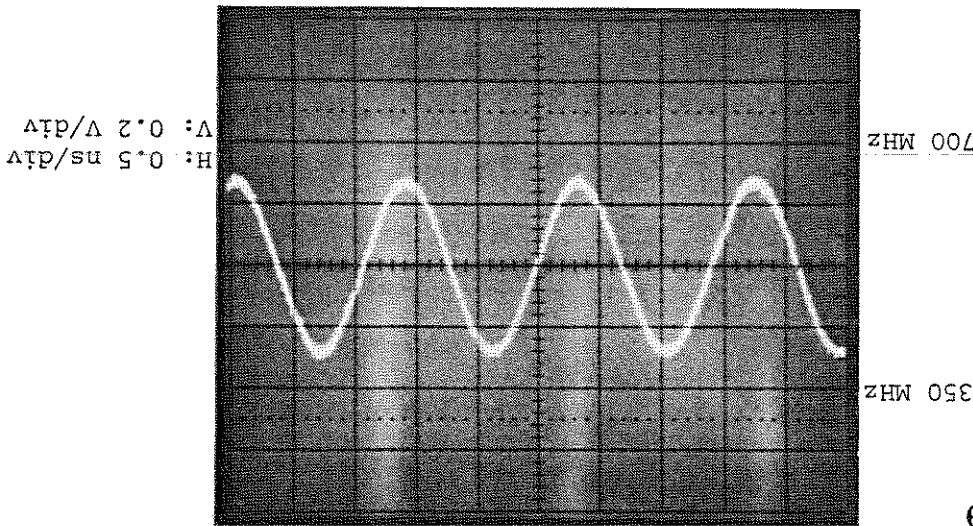
(1) Use a dc voltmeter to measure the dc voltages at Z2 test points 15 to 17 and check that they are as listed in the table below when the input CLOCK signal frequency is set to 350 MHZ and 700 MHZ.

Fig. 3-20 Waveform at Z2 Test Points 13 and 14



If the waveforms are abnormal, troubleshoot the peripheral circuits from Q68 to Q83, and the peripheral circuits.

Fig. 3-21 Waveform at Z2 Test Point 18



18

Also check the waveform when the CLOCK frequency of the ME522A Transmitter is changed from 350 to 700 MHz.

If the waveform is as shown in Fig. 3-21, go to the next step.

(m) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point 18 .

If voltages are normal, go to the next step. If they are abnormal, troubleshoot the circuits for Q64 and Q63, and the peripheral circuits.

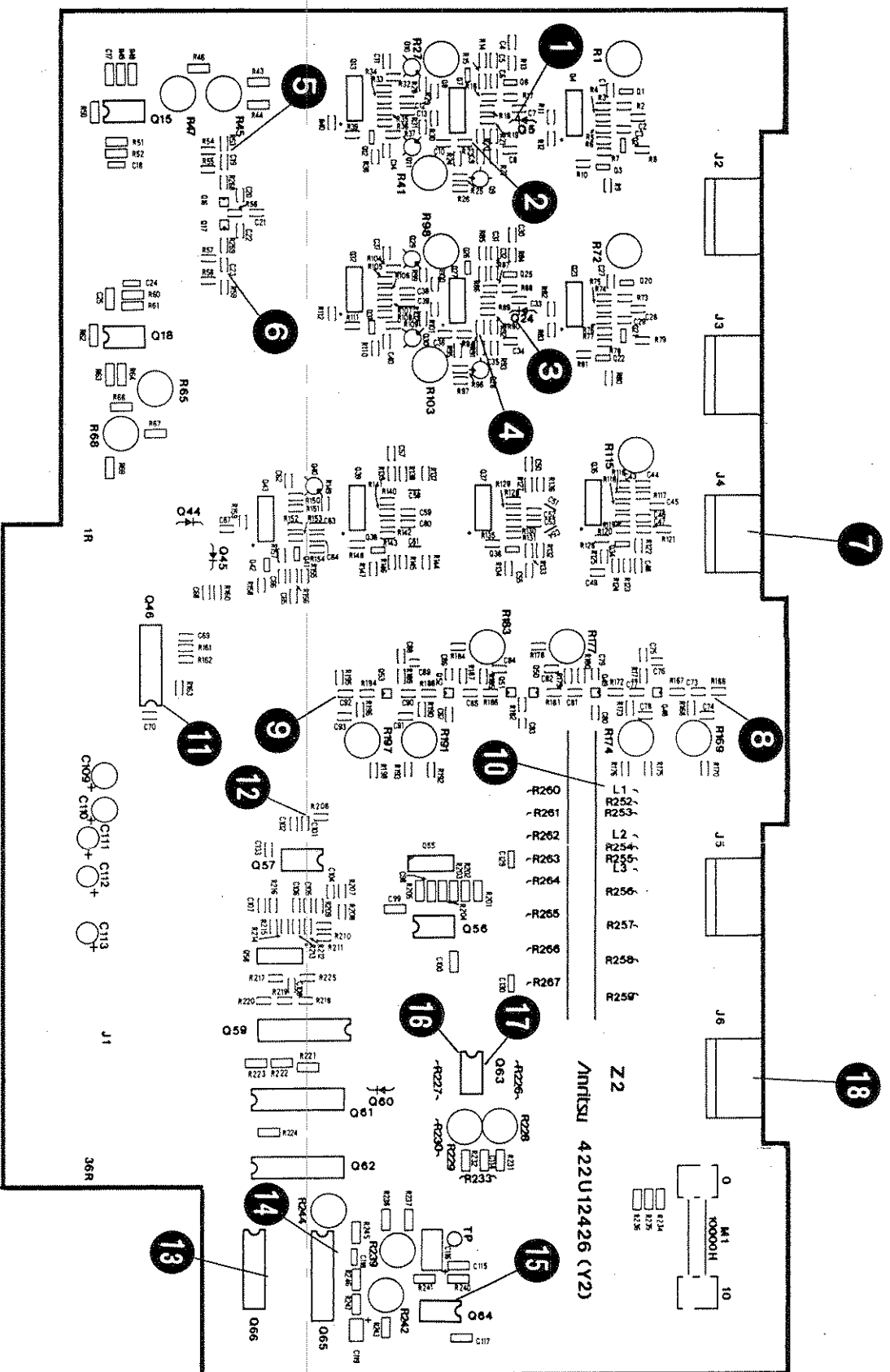


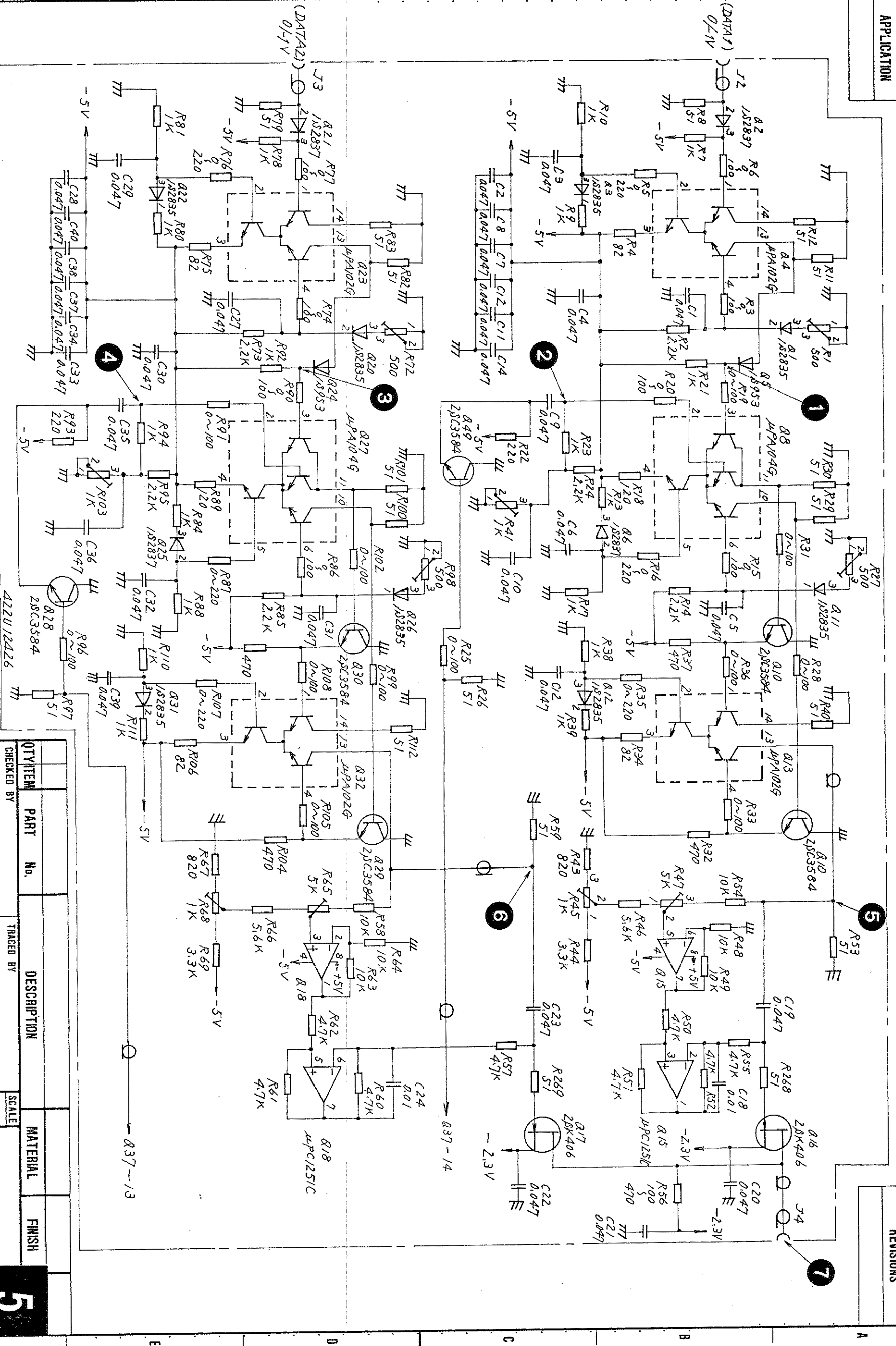
Fig. 3-22

Parts Layout of MH676A Z2
Mux Input PC Board **5**

3-57/(3-58 blank)

APPLICATION

REVISIONS



DEP

Parts List 44W 83351

| QTY | ITEM | PART | No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|------|-----|--|-------------|--------|
| | | | | TRACED BY | | |
| | | | | CHECKED BY | | |
| | | | | APPROVED BY | | |
| | | | | TITLE Z 2 MUX (Multi-Plexer) INPUT Circuit Diagram | | |
| | | | | DRAWN BY | Mick Akashi | |
| | | | | DRAWING No. 43W33611 1/4 | | |
| | | | | 3-59/3-60 | | |
| | | | | 5 | | |

No. 00231985.08

43W33611 1/4

2

3

4

5

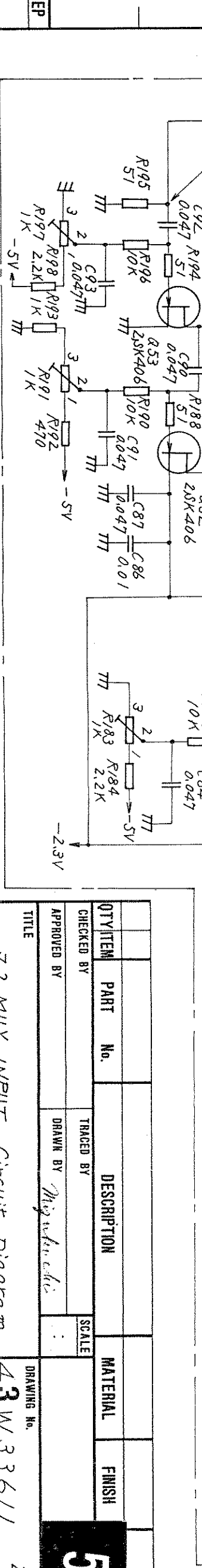
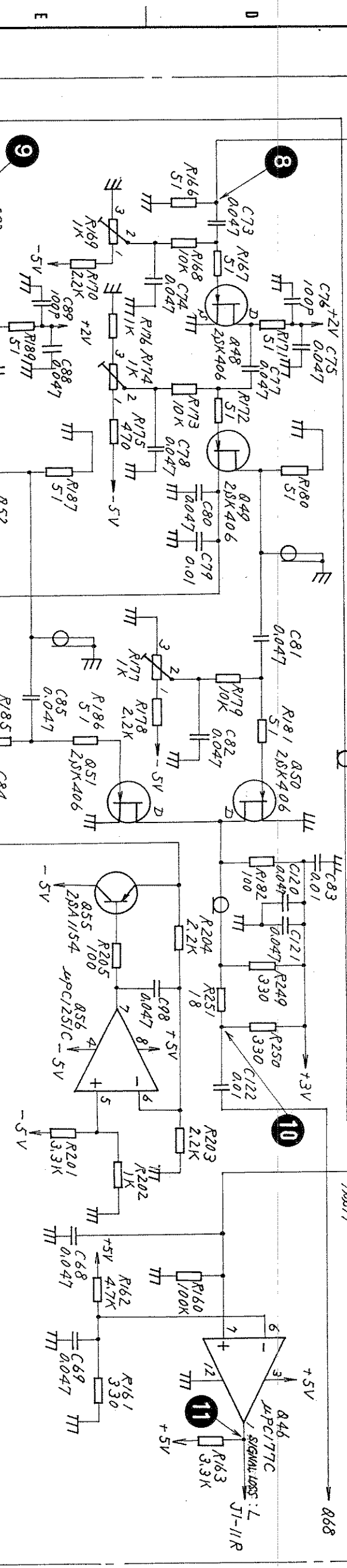
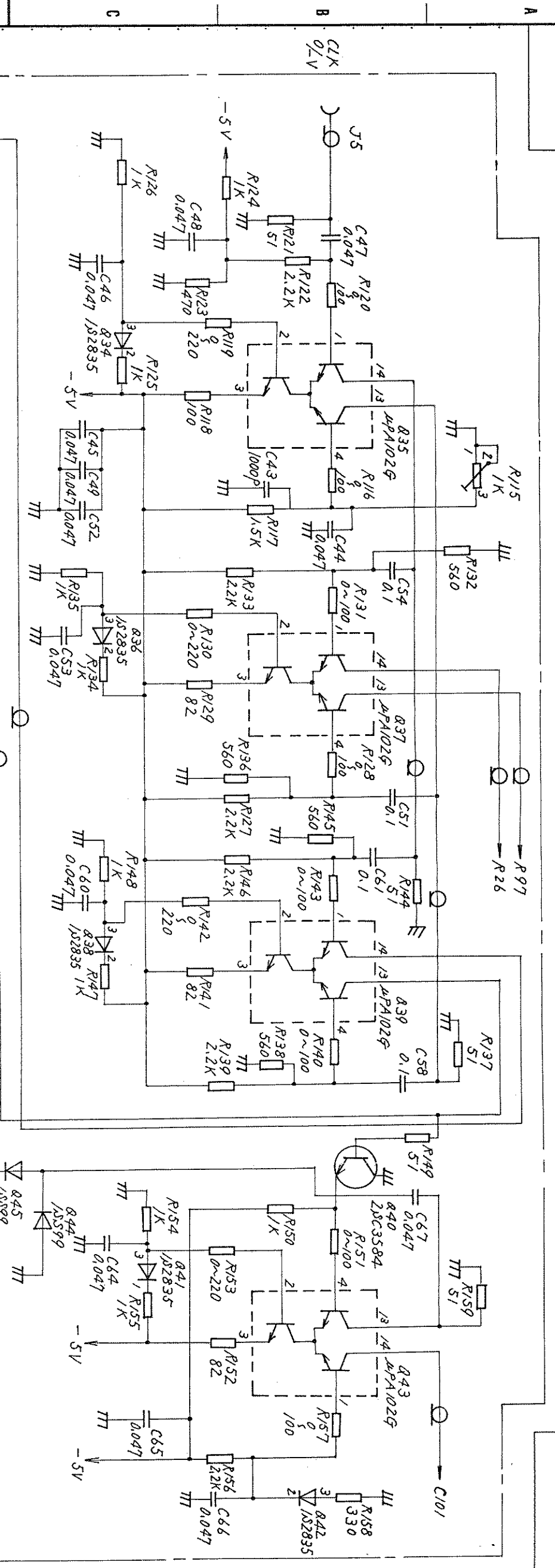
6

7

8



ANRITSU CORP.



DEP

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

CHECKED BY _____ TRACED BY _____
 APPROVED BY _____ DRAWN BY *Miyake*
 TITLE: Z2 MUX INPUT Circuit Diagram
 DRAWING No. 43W33611

5

No. 0023-1985-08

43W33611 2/4

2

3

4

5

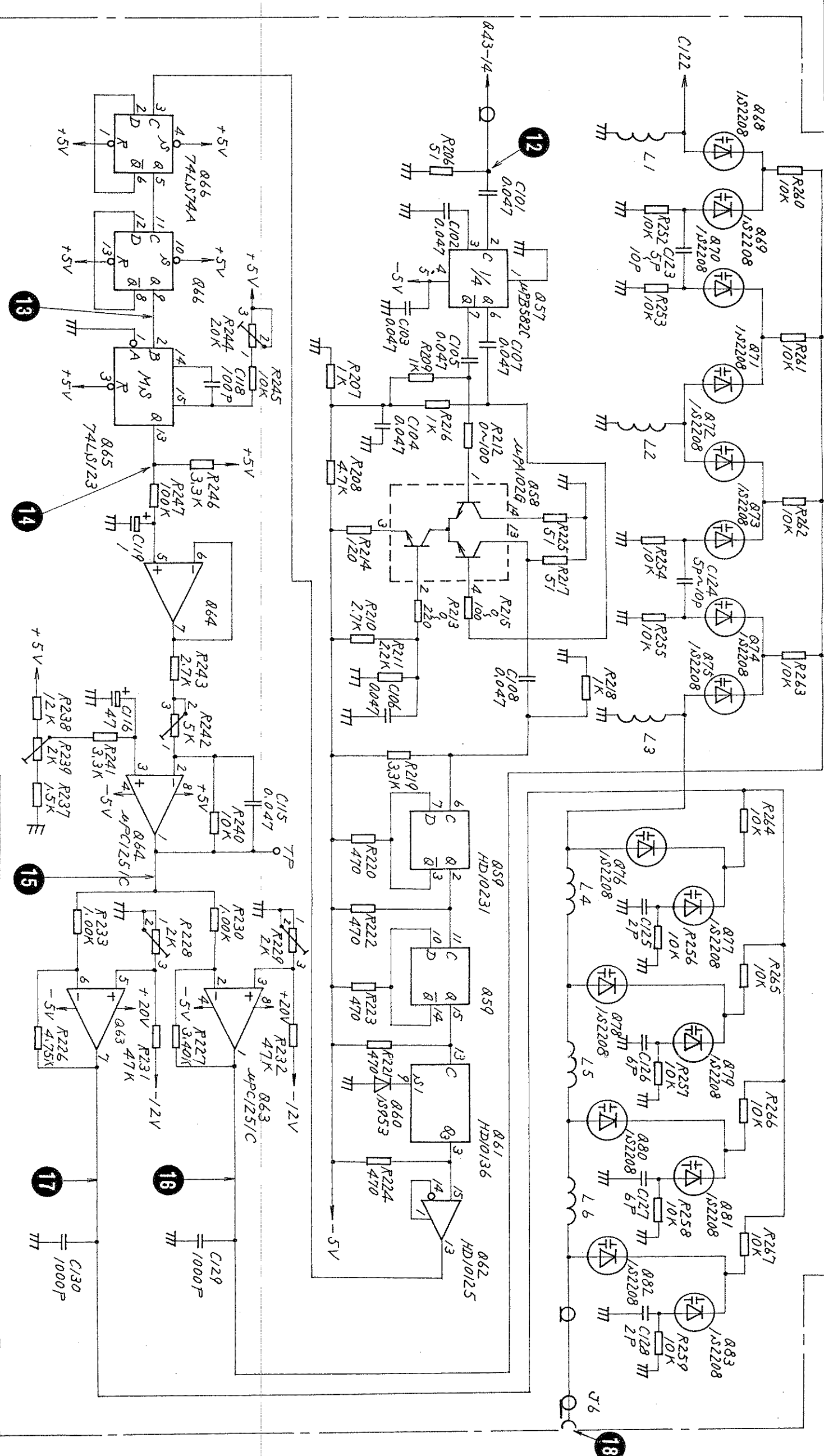
6

7

8

ANRITSU CORP.

3-61/3-62



DEP

No. 0023-1985.08

43W33611/3/4

2

3

4

5

6

7

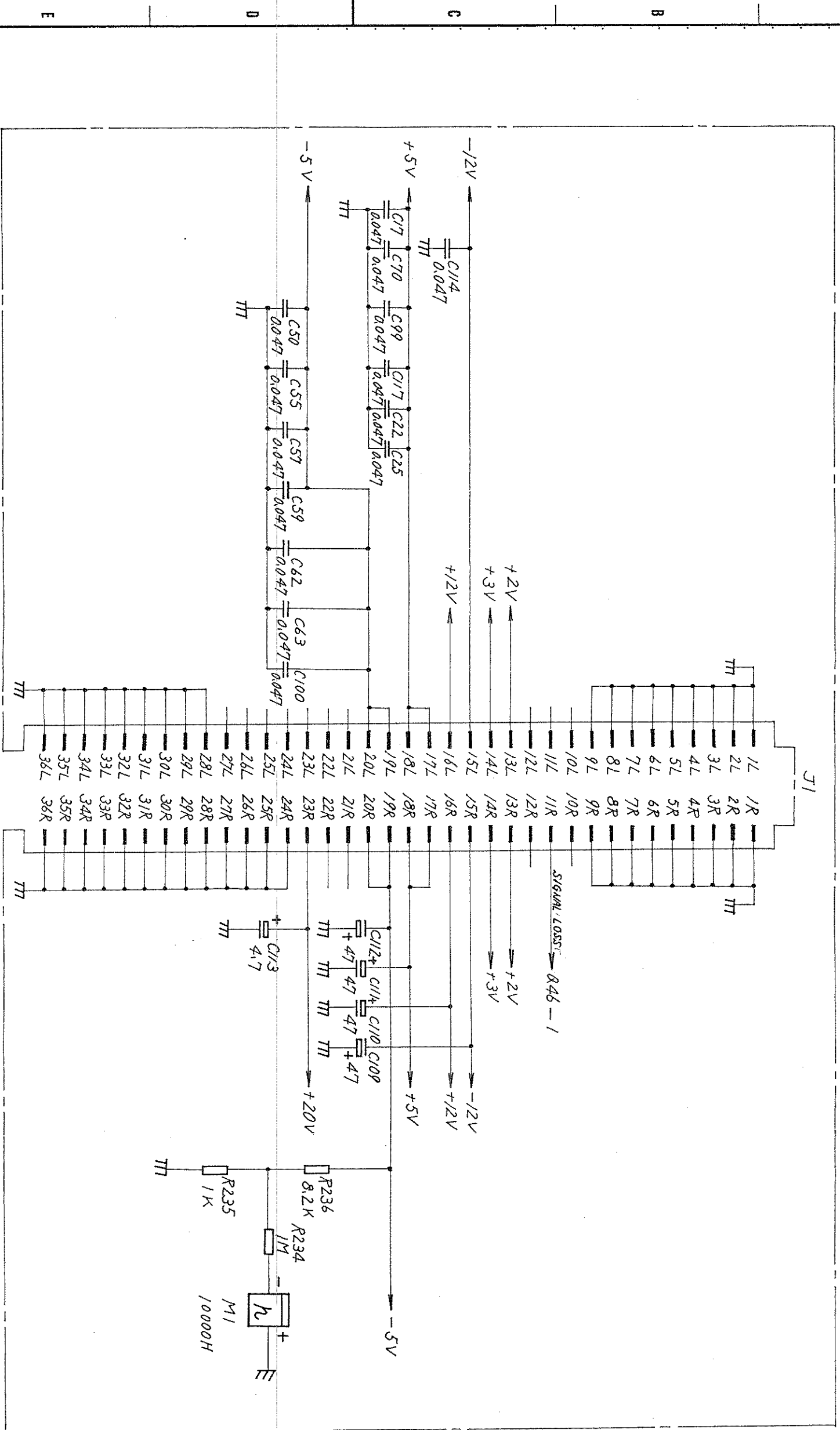
8

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|-------------|------------------------------|-------------|-------------|--------|
| | CHECKED BY | | TRACED BY | | |
| | APPROVED BY | | DRAWN BY | Miguelobski | |
| | TITLE | Z2 MUX INPUT Circuit Diagram | | | |
| | DRAWING No. | 43W33611/3/4 | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

5

ANRITSU CORP.

3-63/3-64



DEP

| | | | | | |
|------------------------------|------|------------------------------|---------------|----------|--------|
| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| | | | | | |
| CHECKED BY | | TRACED BY | | SCALE | |
| APPROVED BY | | DRAWN BY <i>Muguraku chi</i> | | | |
| TITLE | | | DRAWING No. | | |
| Z2 MUX INPUT Circuit Diagram | | | 43W 33611 4/4 | | |

5

No. 0023-1985, 08

43W 33611 4/4

1 2 3 4

5

6

7

8



ANSITSU CORP.

3-65/3-66

Figure 3-23 shows the Z1 Multiplexer output circuit block diagram. This circuit receives DATA and CLOCK signals from the Z2 Multiplexer input PC board. DATA signals are retimed by a D-type flip-flop and are DATA output through an AND-gate for format conversion (NRZ and RZ) and an output amplifier. The output amplifier shapes and amplifies the DATA signals. The AMPLITUDE voltage is controlled by a control signal sent from the CONTROL PC board. A control signal is sent from the CONTROL PC board through the offset circuit to control the offset voltage. The CLOCK signal is branched into three signals: one is sent to the D-type flip-flop, one to the AND-gate to convert the format, and one to the output amplifier. Control signals sent from the CONTROL PC board are also used to control the AMPLITUDE and OFFSET voltages in the output amplifier and OFFSET circuits (as for the DATA output circuit).

(1) Circuit description

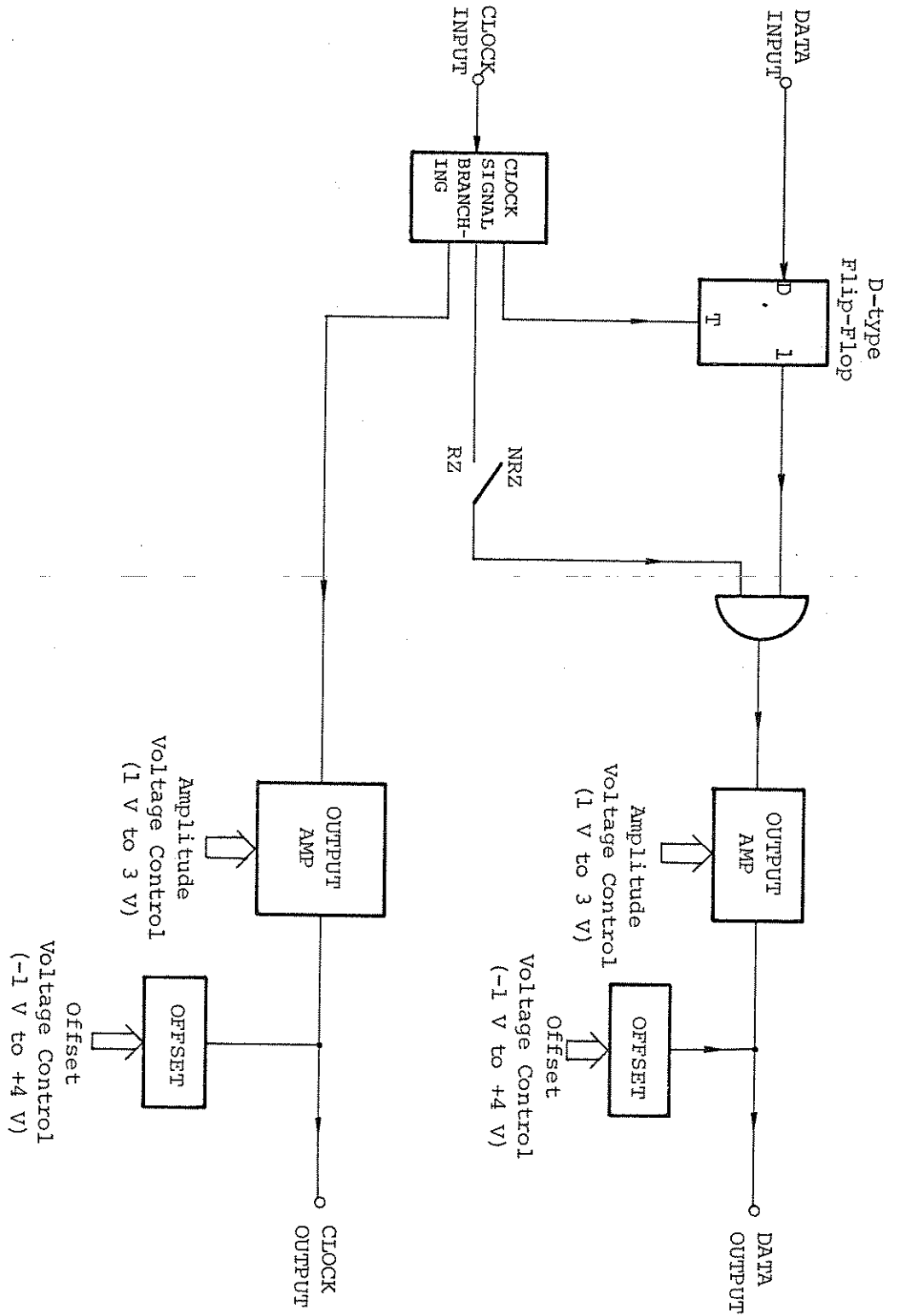


Fig. 3-23 Block Diagram of MH676A Z1 MUX OUTPUT

(2) Troubleshooting

(a) Disconnect all connectors that are connected to J2 to J4 of PC board Z1.

Remove the PC board Z1, insert the extender board in to the Z1 position and connect the PC board Z1 to it.

Connect J2 and J3 of PC board Z1 to J4 and J6 of PC board Z2 using cables of the same length. (SMA-P-RG58A/U·SMA-P 50 cm coaxial cable)

(b) Setting ME522A Transmitter and MH676A

1. ME522A Transmitter

Frequency: 350 MHz

PATTERN : PRBS 2²³-1

LOAD : 50 Ω

LOGIC : Normal

2. MH676A

Turn the power on with the LOCAL key held down to initialize the MH676A.

(c) Use the sampling oscilloscope with probe

(MP671A) to check the waveform at Z1 test

point ① . If the waveform is as shown in

Fig. 3-24, go to the next step. If the

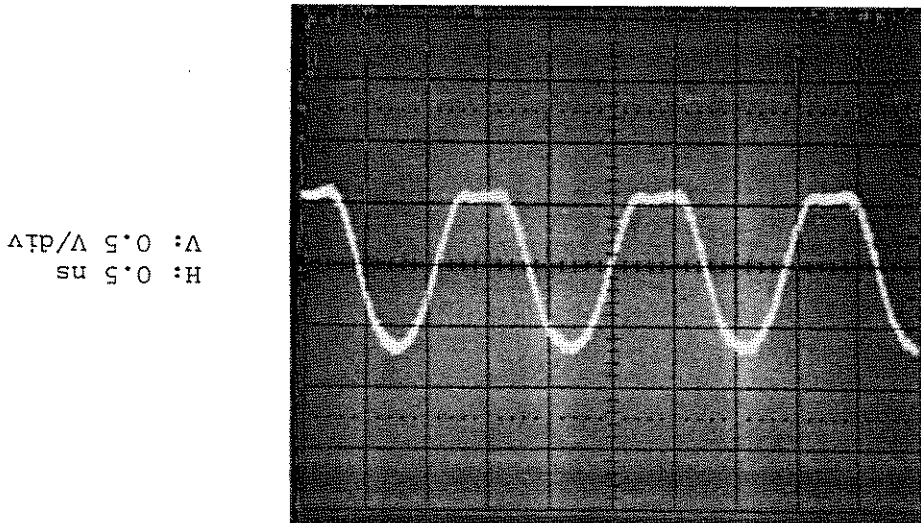
waveform is abnormal, troubleshoot the

circuits for Q12, Q13, and Q46, and the

peripheral circuits.

(d) Use the sampling oscilloscope with probe (MP671A) to check the waveform and phase at Z1 test points ② and ③. If they are as shown in Fig. 3-25, go to the next step. If test point ③ does not meet the specified standards, troubleshoot the circuits for Q15 and Q5, and the peripheral circuits. If test point ② does not meet the specified standards, perform the same troubleshooting as for Z2 test point ⑦. (See Fig. 3.5.4.)

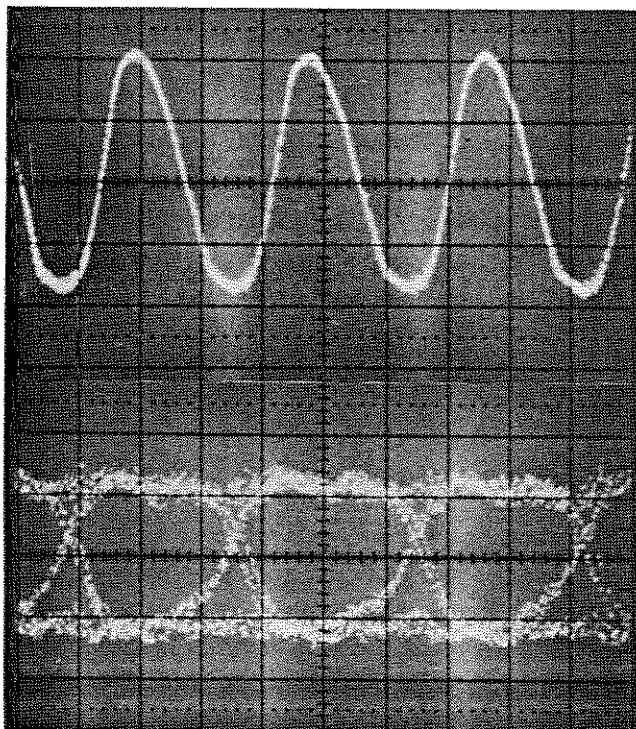
Fig. 3-24 Waveform at Z1 Test Point ①



(e) use the sampling oscilloscope with probe (MP671A) to check the waveforms at Z1 test points ④ and ⑤. If the waveforms are as shown in Fig. 3-26, go to the next step. If the waveforms are abnormal, troubleshoot the circuit for Q6, and the peripheral circuits.

Fig. 3-25 Waveforms at Z1 Test Points ② and ③

H: 0.5 ns/div
V: 0.5 V/div



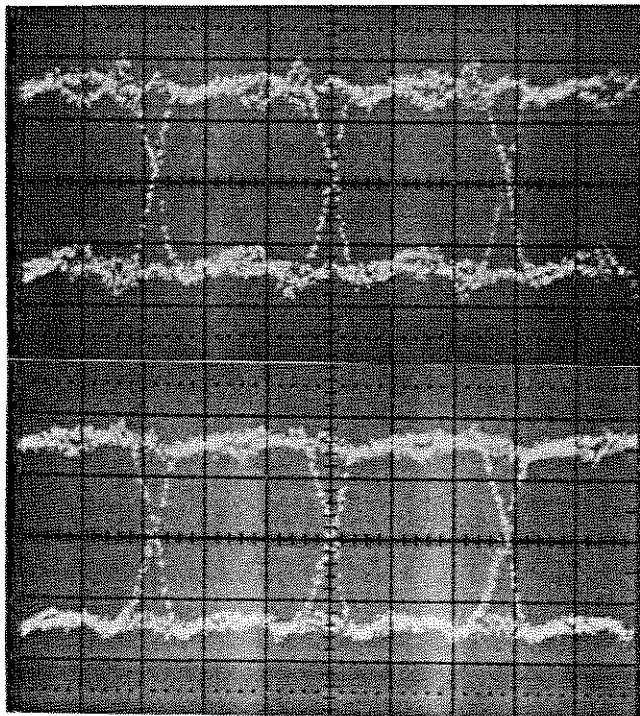
③

②

(F) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑥. If the waveform is as shown in Fig. 3-27, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q27 and Q18, and the peripheral circuits.

Fig. 3-26 Waveforms at Z1 Test Points ④ and ⑤

H: 0.5 ns/div
V: 0.5 V/div



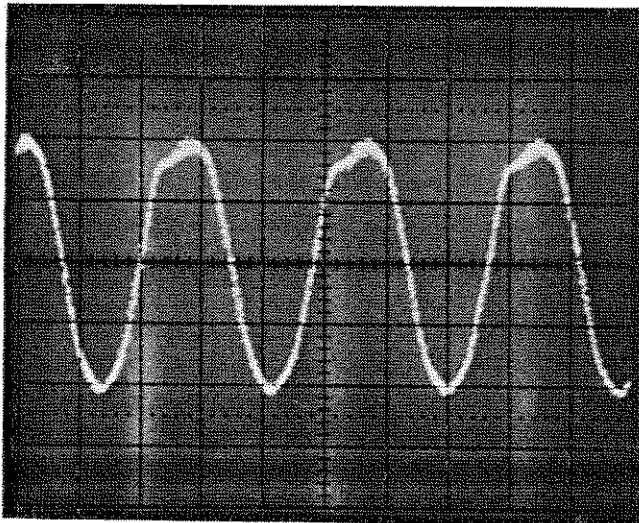
⑤

④

(g) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑦. Figure 3-28 shows the normal waveform. The waveform must be checked in both NRZ and RZ formats. If the NRZ waveform is abnormal, troubleshoot the circuits for Q8, Q9, and Q25, and the peripheral circuits. If the RZ waveform is abnormal, troubleshoot the peripheral circuits of Q24 and K2.

Fig. 3-27 Waveform at Z1 Test Point ⑥

H: 0.5 ns/div
V: 0.5 V/div



(h) Use the sampling oscilloscope to check the waveform at Z1 test point ⑧. Figure 3-29 shows the normal waveform. The waveform must be checked in both NRZ and RZ formats. If the waveforms are abnormal, troubleshoot the circuits for Q21, Q22, Q28, and Q30, and the peripheral circuits.

Fig. 3-28 Waveform at Z1 Test Point ⑦

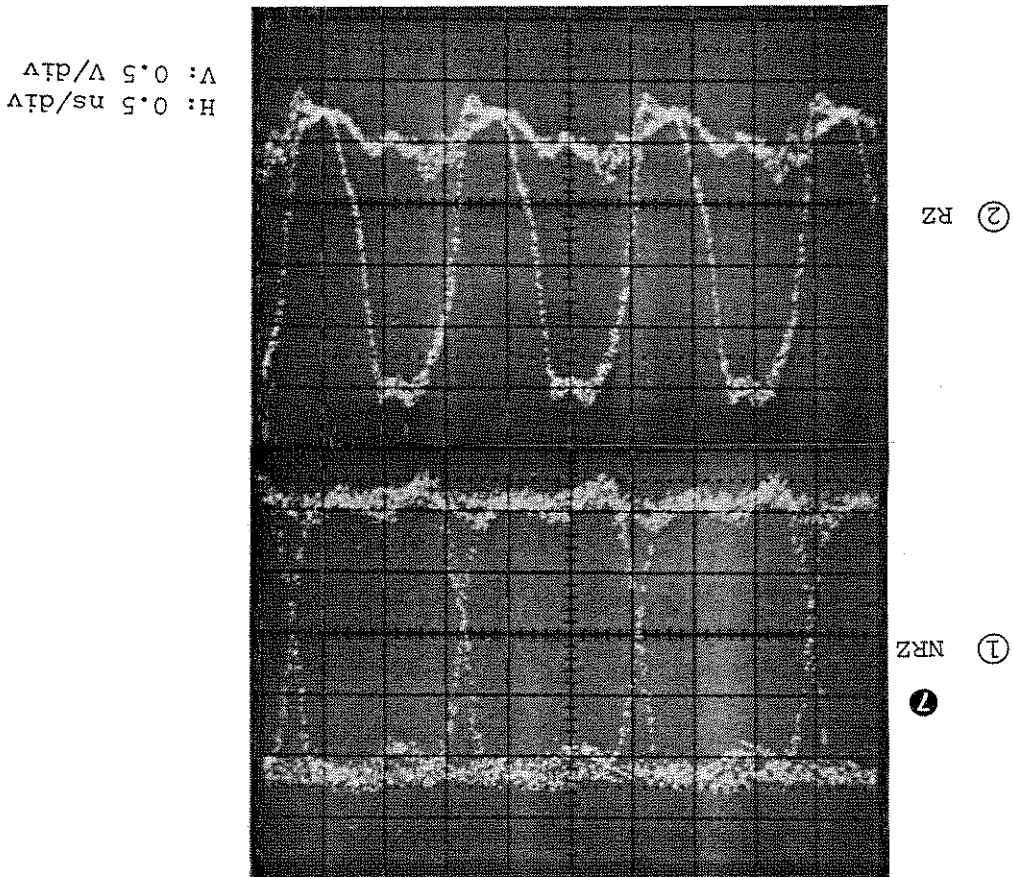
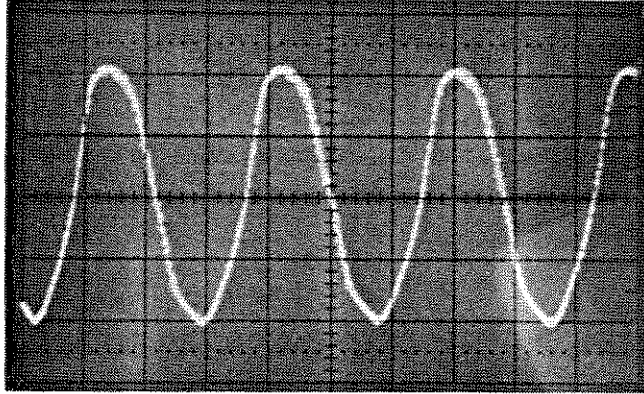


Fig. 3-30 Waveform at Z1 Test Point ⑨

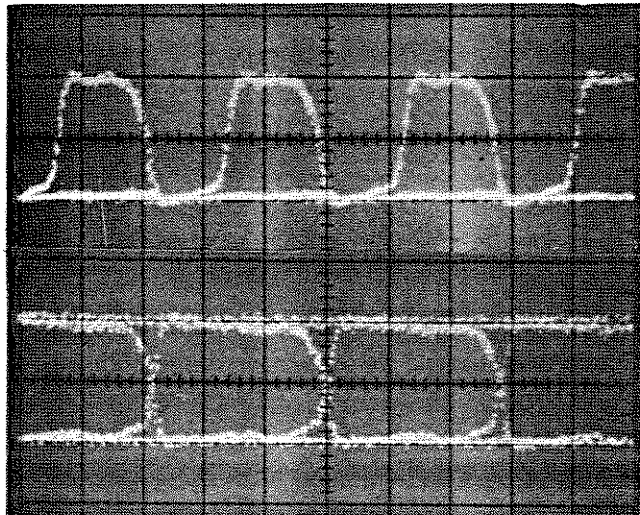
H: 0.5 ns/div
V: 0.5 V/div



(1) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑨. If the waveform is as shown in Fig. 3-30, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q15 and Q16, and the peripheral circuits.

Fig. 3-29 Waveforms at Z1 Test Point ⑧

H: 0.5 ns/div
V: 0.5 V/div



② RZ

① NRZ

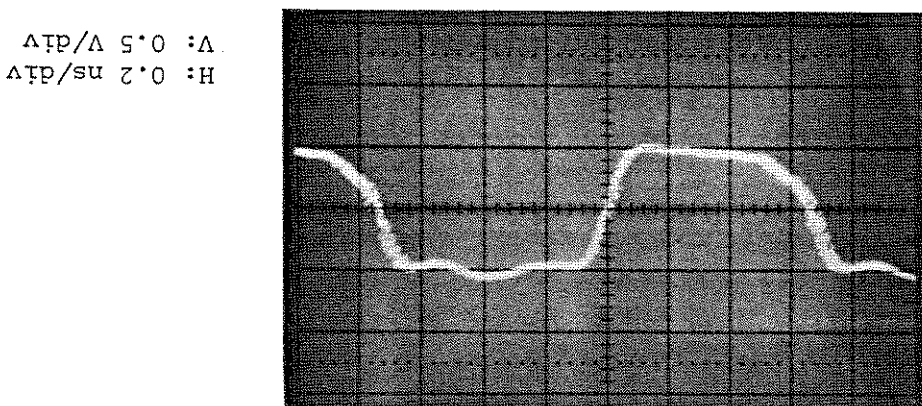
The above table lists the standard values. The tolerance range is $\pm 10\%$.

| | | | | | |
|----|-------|----|-------|----|-------|
| 11 | 1.5 V | 12 | 2.0 V | 13 | 3.0 V |
|----|-------|----|-------|----|-------|

Table 3-8 Dc Voltages at Z1 Test Points 11, 12, and 13

(k) Use a dc voltmeter to check the dc voltages at Z1 test points 11, 12, and 13. If the voltages are as listed in Table 3-8, go to the next step. If the voltage is abnormal, troubleshoot the circuit for Q47 and Q49, and the peripheral circuits.

Fig. 3-31 Waveform at Z1 Test Point 10



(j) Use the sampling oscilloscope with probe to check the waveform at Z1 test point 10. If the waveform is as shown in Fig. 3-31, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q35, Q32, and Q33, and the peripheral circuits.

| | | | | |
|--------------|-----|----------------|----------------|----------------|
| CLOCK OUTPUT | 1 V | +0.4 to +0.5 V | +1 to +1.2 V | -1.1 to -1.3 V |
| AMPLITUDE | 3 V | +1.1 to +1.3 V | +3.1 to +3.5 V | -3.5 to -3.9 V |
| | | ⑭ | ⑮ | ⑯ |

Table 3-11 Dc Voltages at Z1 Test Points
⑰ , ⑱ , and ⑲

| | | | |
|-------------|------|----------------|----------------|
| DATA OUTPUT | -1 V | +0.4 to +0.5 V | +1.0 to +1.2 V |
| OFFSET | +4 V | +2.4 to +2.6 V | -4.0 to -4.4 V |
| | | ⑳ | ㉑ |

Table 3-10 Dc Voltages at Z1 Test Points
㉒ and ㉓

| | | | | |
|-------------|-----|----------------|----------------|----------------|
| DATA OUTPUT | 1 V | +0.4 to +0.5 V | +1 to +1.2 V | -1.0 to -1.2 V |
| AMPLITUDE | 3 V | +1.1 to +1.3 V | +3.0 to +3.5 V | -3.3 to -3.6 V |
| | | ㉔ | ㉕ | ㉖ |

Table 3-9 Dc Voltages at Z1 Test Points
㉗ , ㉘ , and ㉙

(1) Use a dc voltmeter to check the dc voltages at Z1 test points ㉚ to ㉛ .

If the voltages are as listed in Tables 3-9 to 3-12, go to the next step. If the voltages are abnormal, troubleshoot the circuits for Q36 to Q39, Q42, and Q43, and the peripheral circuits.

| CLOCK | OUTPUT | OFFSET |
|-------|----------------|----------------|
| -1 V | +0.4 to +0.5 V | +1.1 to +1.3 V |
| +4 V | +2.4 to +2.6 V | -4.0 to -4.4 V |

Table 3-12 DC Voltages at Z1 Test Points
 19 and 20

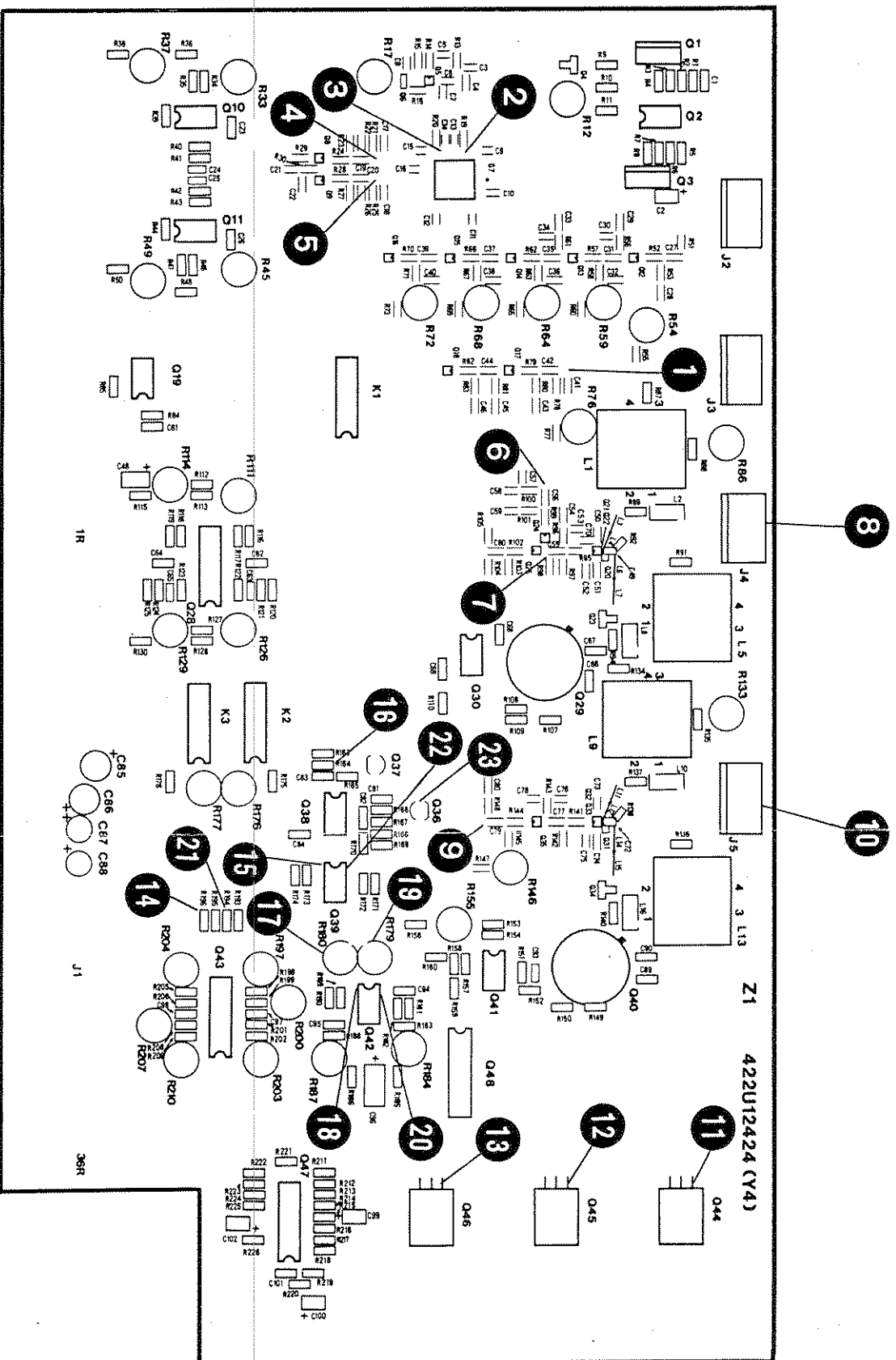
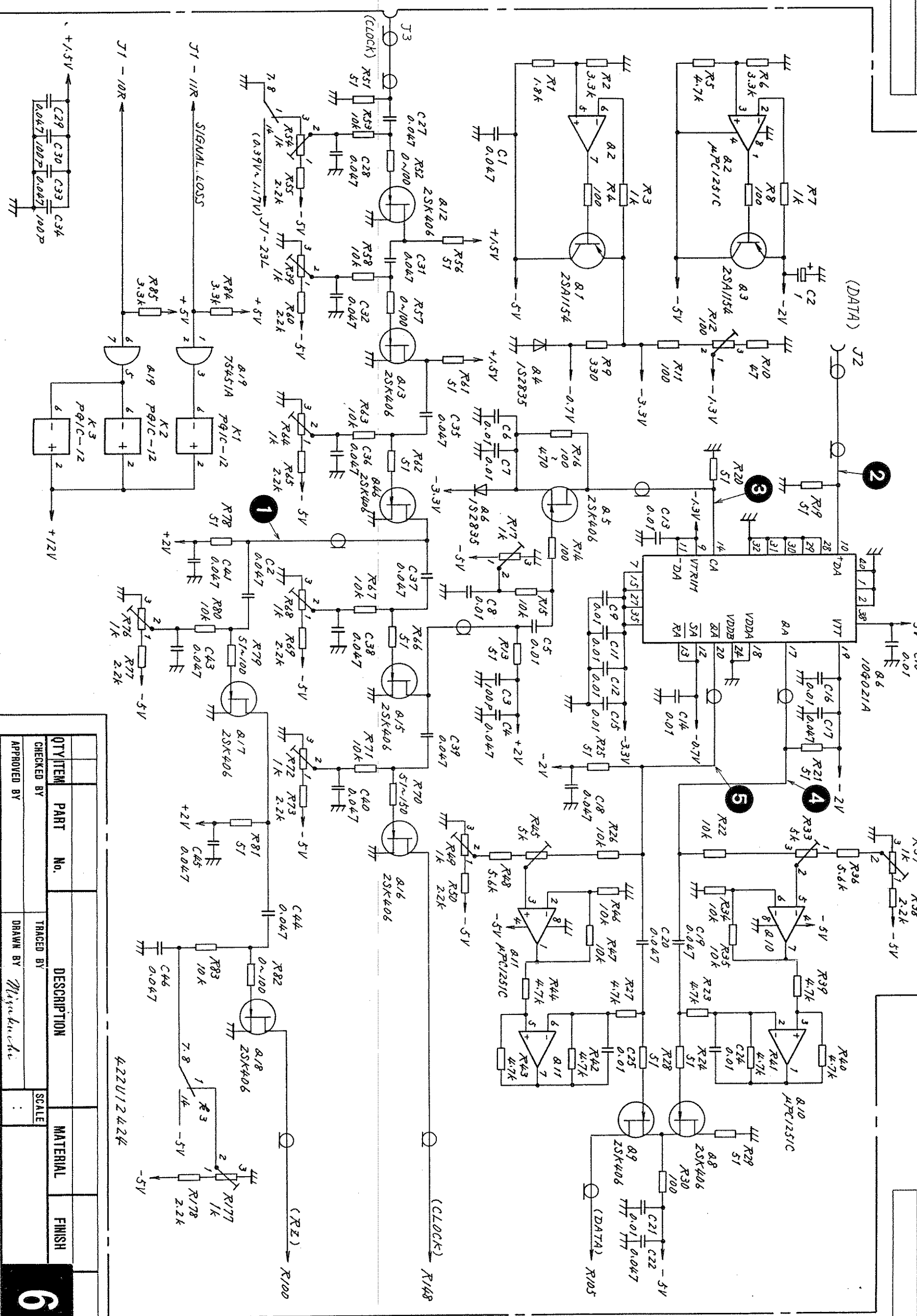


Fig. 3-32

Parts Layout of MH676A Z1
Mux Output PC Board **6**

3-79/(3-80 blank)



DEP

1
2
3
4
5
6
7
8

1
2
3
4
5
6
7
8

1
2
3
4
5
6
7
8

1
2
3
4
5
6
7
8

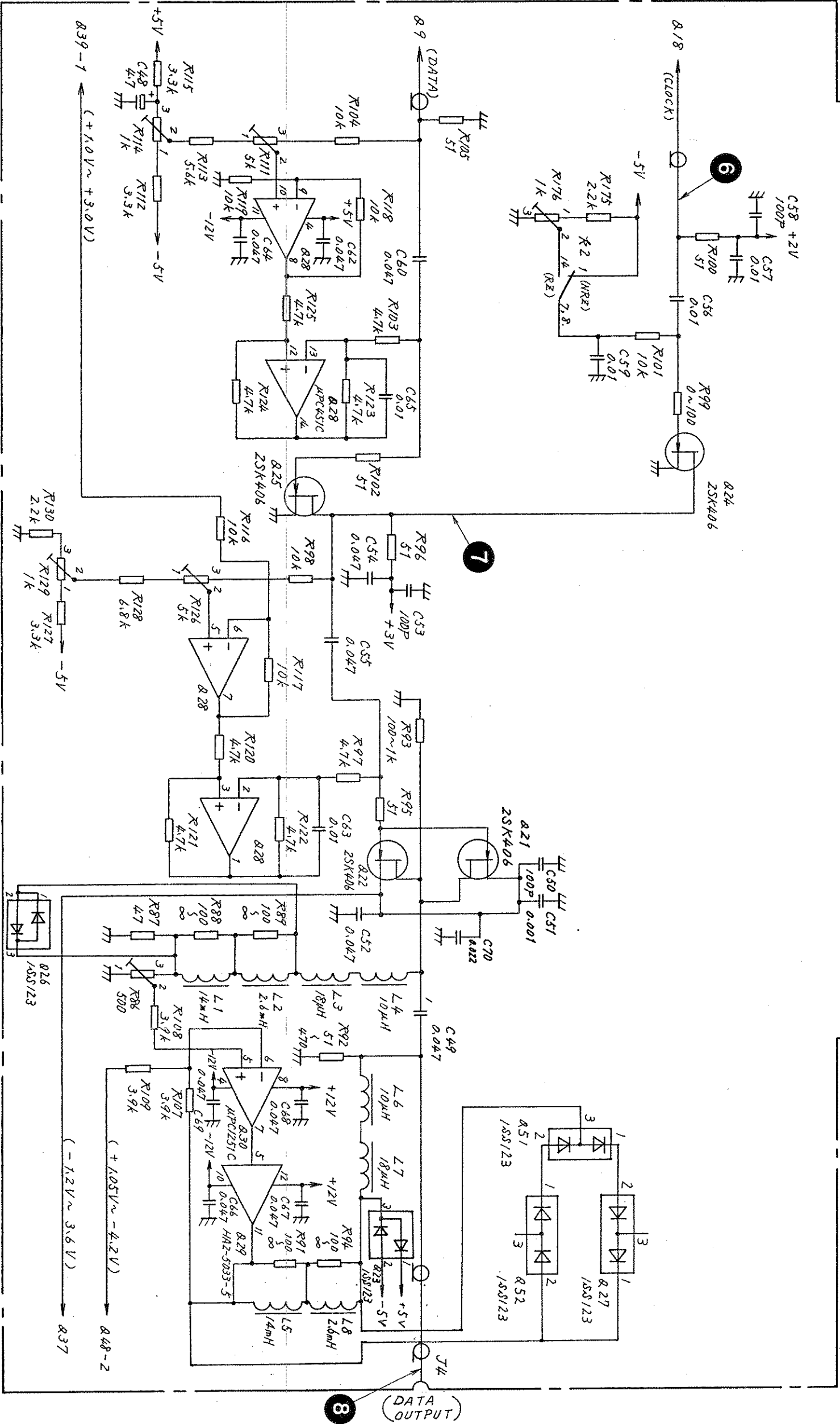
1
2
3
4
5
6
7
8

1
2
3
4
5
6
7
8

Parts List: 44W83350

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-------------|---------------|--|----------|--------|
| | | Z1 MUX (multiplexer) OUTPUT Circuit Diagram. | | |
| APPROVED BY | | TRACED BY | | |
| DRAWN BY | | | | |
| TITLE | | | | |
| DRAWING No. | 43W33610 1/5 | | | |
| | ANRITSU CORP. | | | |
| | 3-81/3-82 | | | |

6



DEP

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|---|------|----------|-------------|----------|--------|
| APPROVED BY _____ | | | | | |
| CHECKED BY _____ | | | | | |
| DRAWN BY <i>Miyafuchi</i> | | | | | |
| SCALE _____ | | | | | |
| TITLE Z1 MUX OUTPUT Circuit Diagram. | | | | | |
| DRAWING No. 43W33610 | | | | | |

6

No. 0023-1985, 08

43W33610 2/5

2

3

4

5

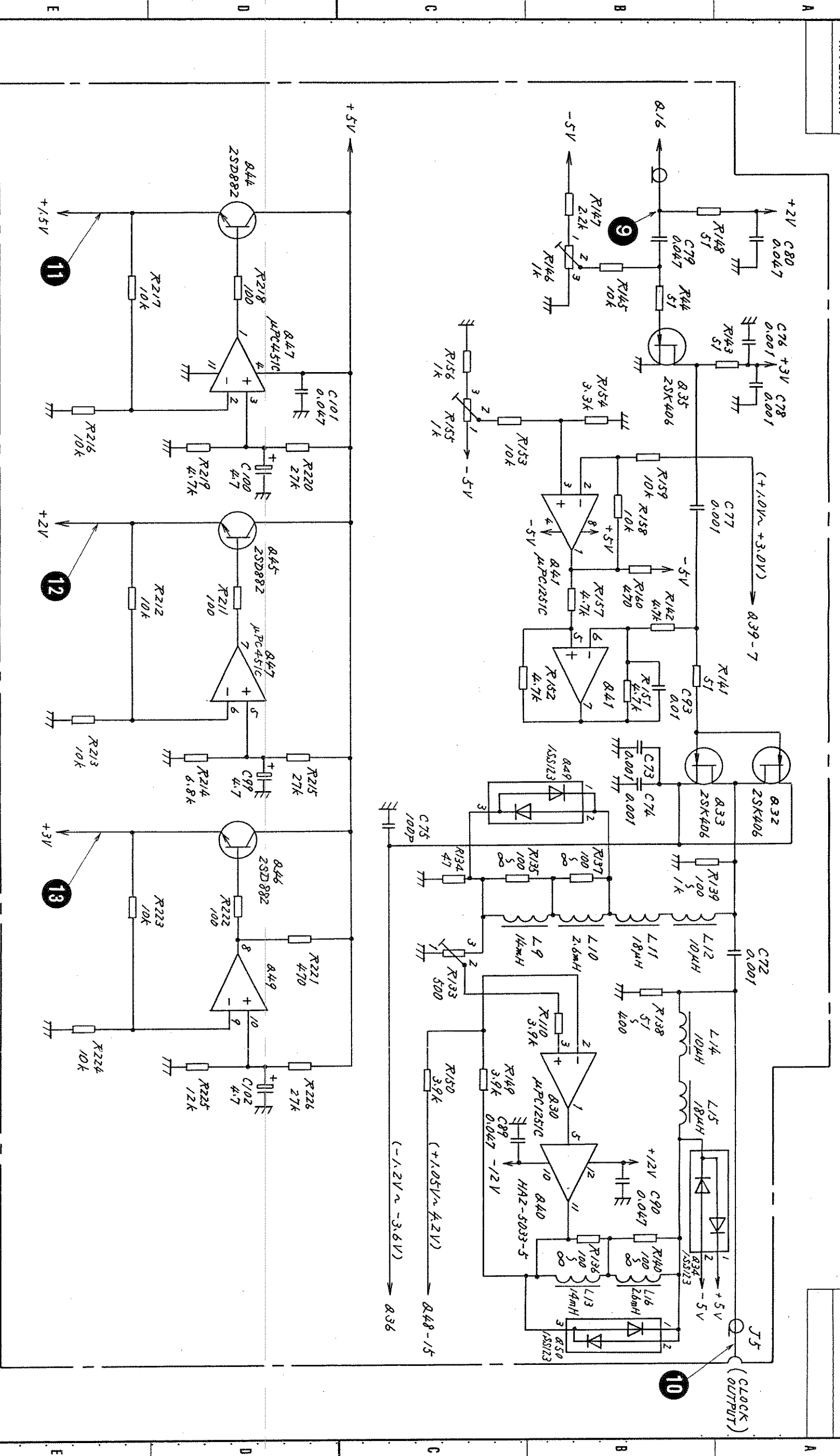
6

7

8

ANRITSU CORP.

3-83/3-84



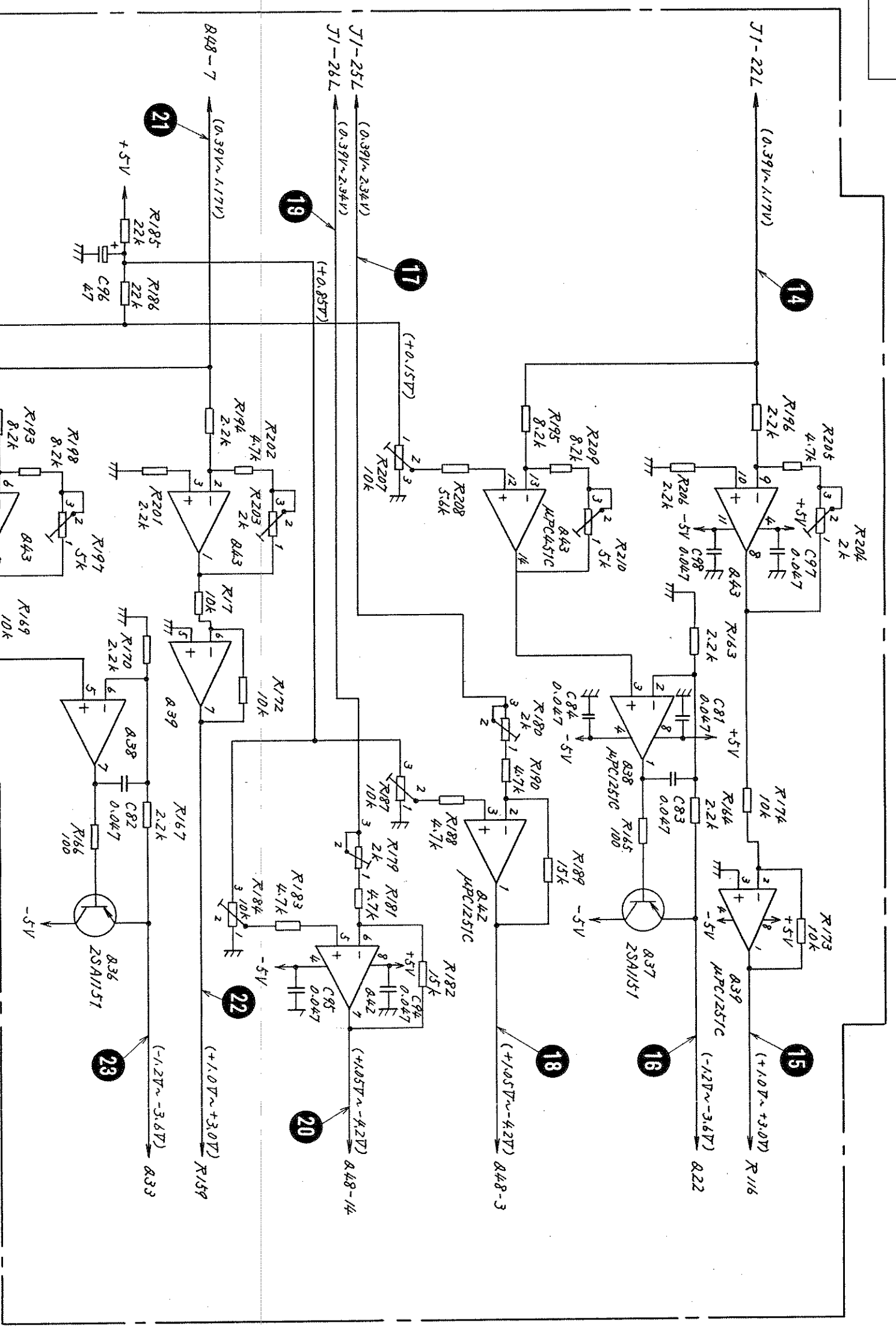
DEP

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------|----------|-------------|----------|--------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

6

TITLE: *Z1 MUX OUTPUT Circuit Diagram.*
 DRAWING No. *43W33610 3/5*

CHECKED BY: _____
 TRACED BY: _____
 APPROVED BY: _____
 DRAWN BY: *Miyasaka, K.*

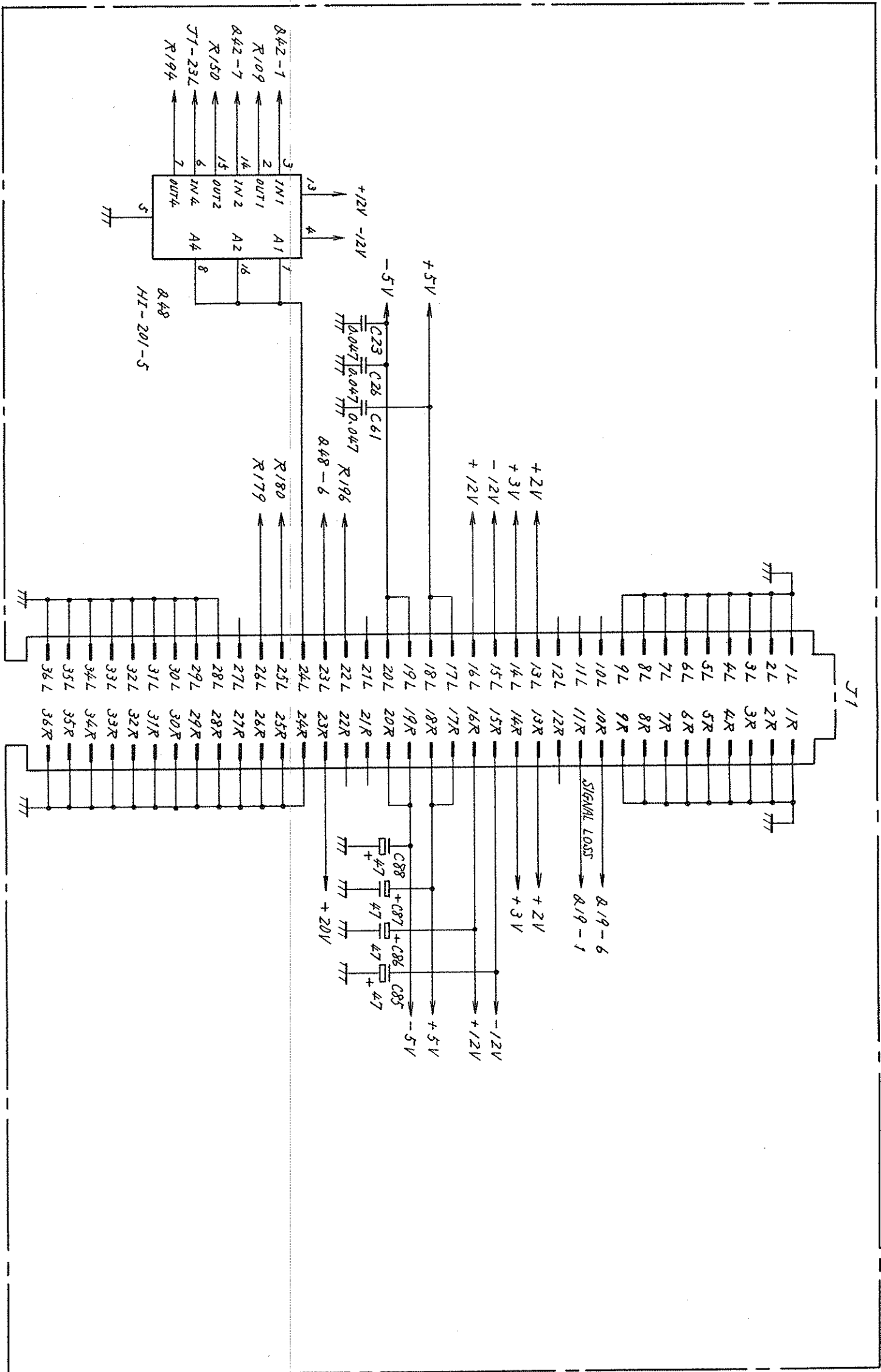


DEP

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

TITLE: Z1 MUX OUTPUT Circuit Diagram.
 CHECKED BY: _____
 TRACED BY: _____
 APPROVED BY: _____
 DRAWN BY: *Miyakawa*
 SCALE: _____
 DRAWING No. 43W33610 4/5

6



DEP

| | | | | | |
|---------------------------------------|------|----------|---------------------------|-----------------|------------|
| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| | | | | | |
| CHECKED BY | | | TRACED BY | SCALE | |
| APPROVED BY | | | DRAWN BY <i>Miyabuchi</i> | | |
| TITLE | | | | DRAWING No. | |
| <i>Z1 MUX OUTPUT Circuit Diagram.</i> | | | | <i>43W33610</i> | <i>5/5</i> |

6

No. 0023-1985.08

43W33610 5/5

2

3

4

5

6

7

8

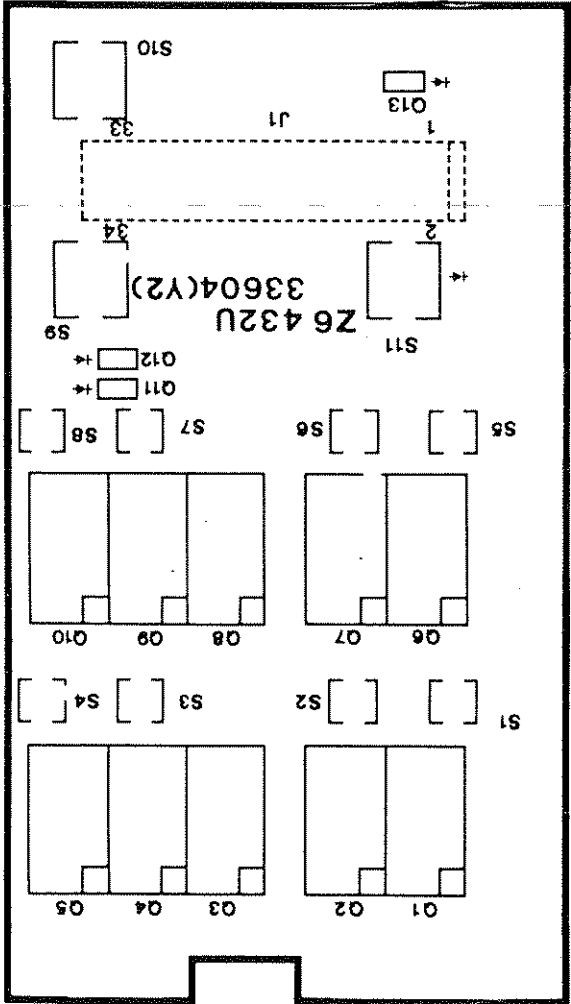
ANRITSU CORP.

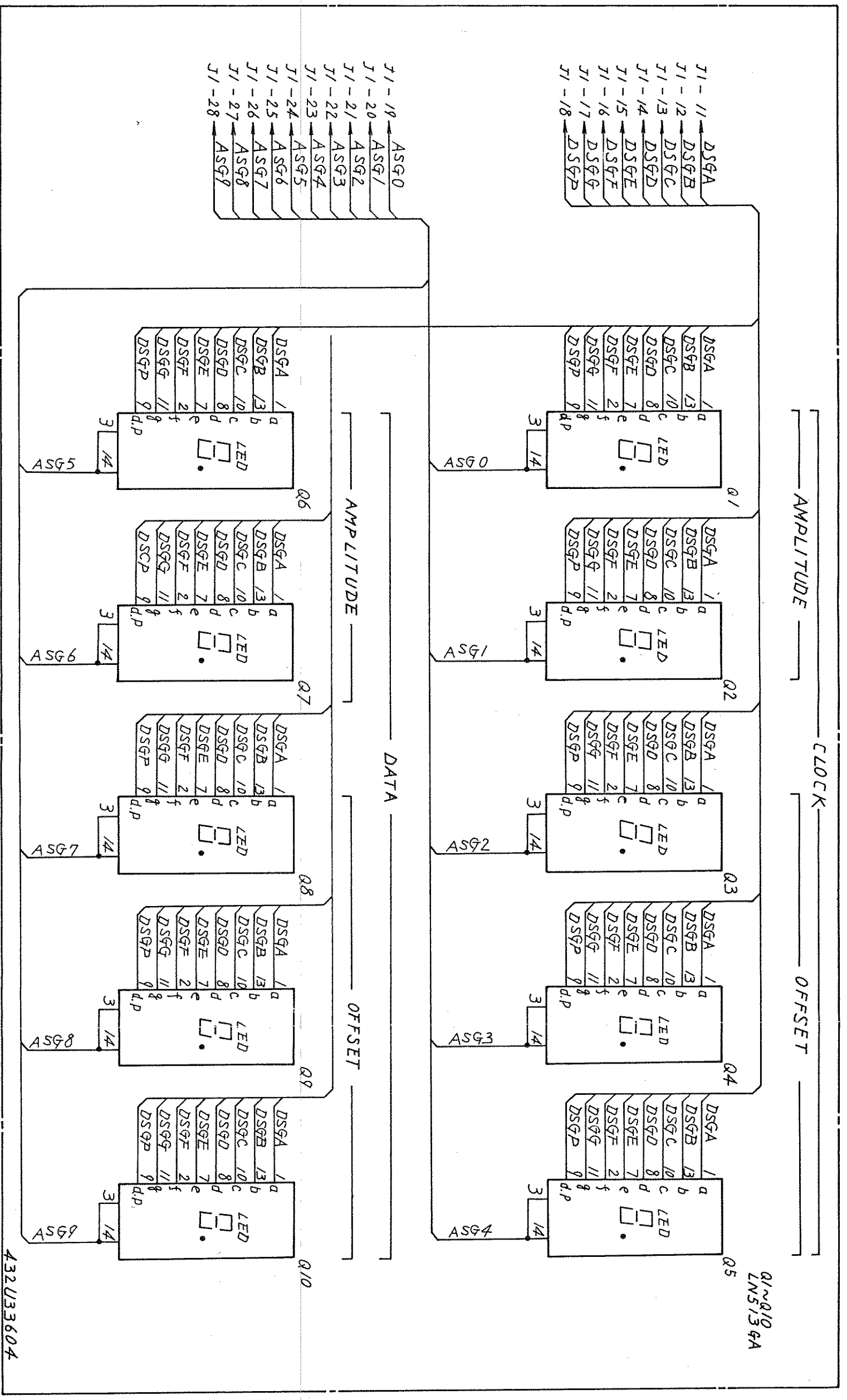
3-89/3-90

DTU/DAI/ABO

3.5.6 MH676A Z6 Display PC board **7**, Z13 GP-IB **8**
and Z14 RS-232C PC board **9**

Fig. 3-33 Parts Layout of MH676A Z6 Display





DEP

| | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|
| No. 0023-1985-08 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43 33615 1/2 | 2 | 3 | 4 | 5 | 6 | 7 | | |

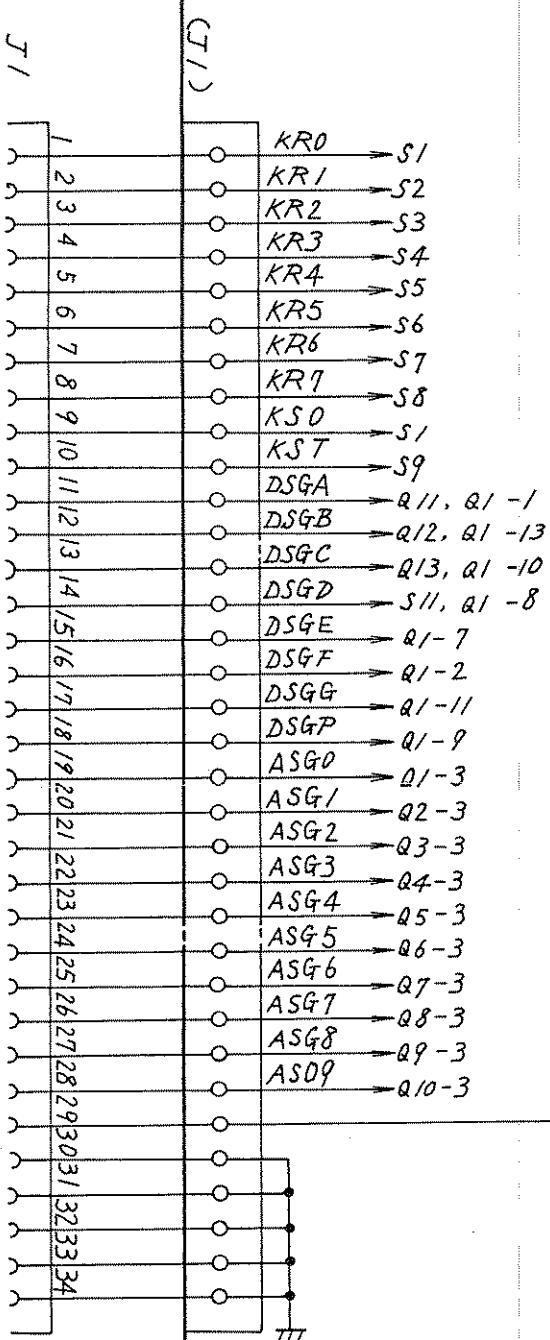
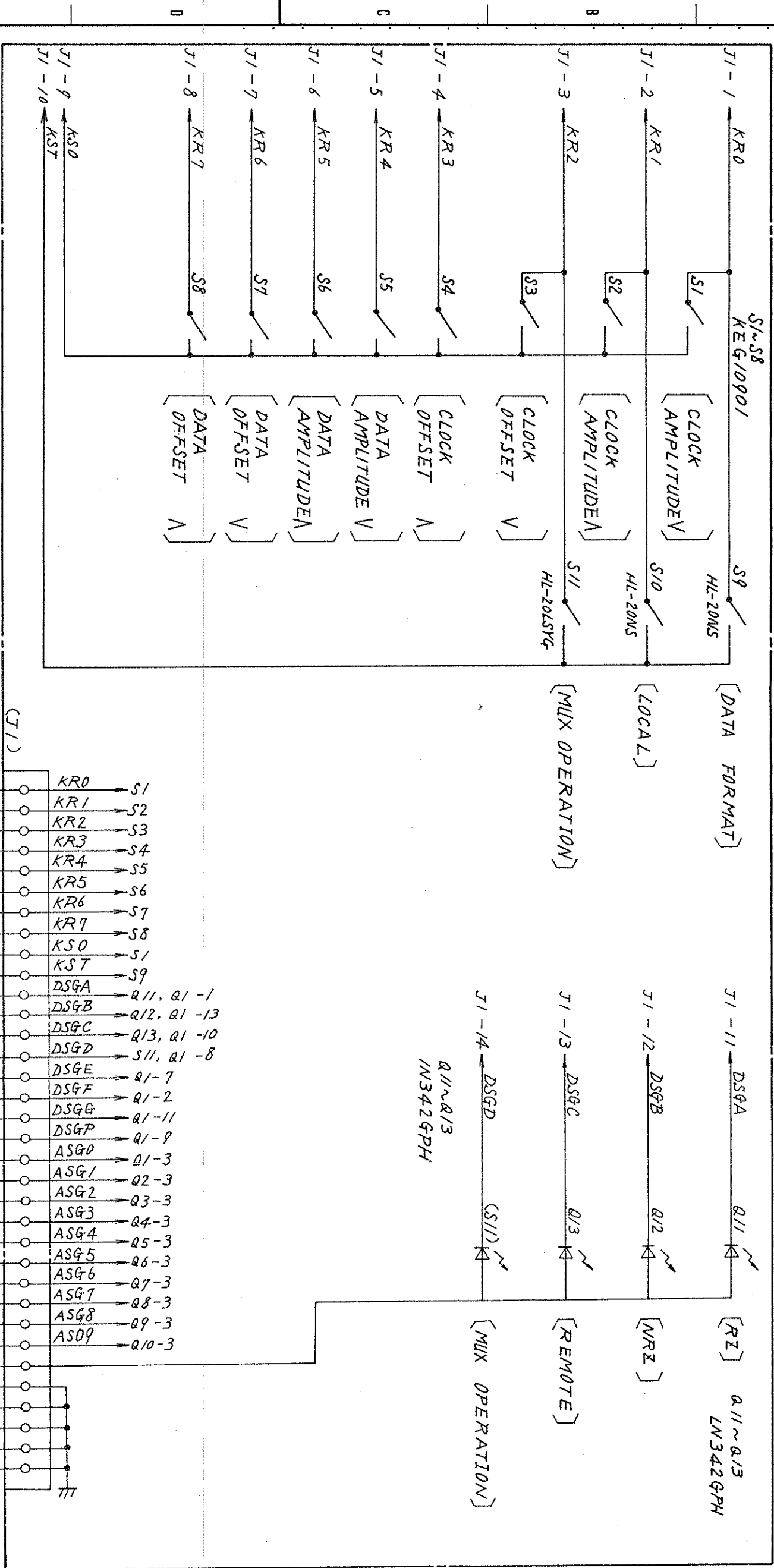
Parts List 44W83360

| | | | | |
|-------------------------------------|-----------|-------------|----------|-------------------------------|
| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| APPROVED BY | TRACED BY | SCALE | | |
| DRAWN BY <i>M. S. ...</i> | | | | |
| TITLE Z6 DISPLAY Circuit Diagram | | | | DRAWING No. 43 W 33615 1/2 |
| ANRITSU CORP. | | | | 3-93/3-94 |

7

APPLICATION

REVISIONS



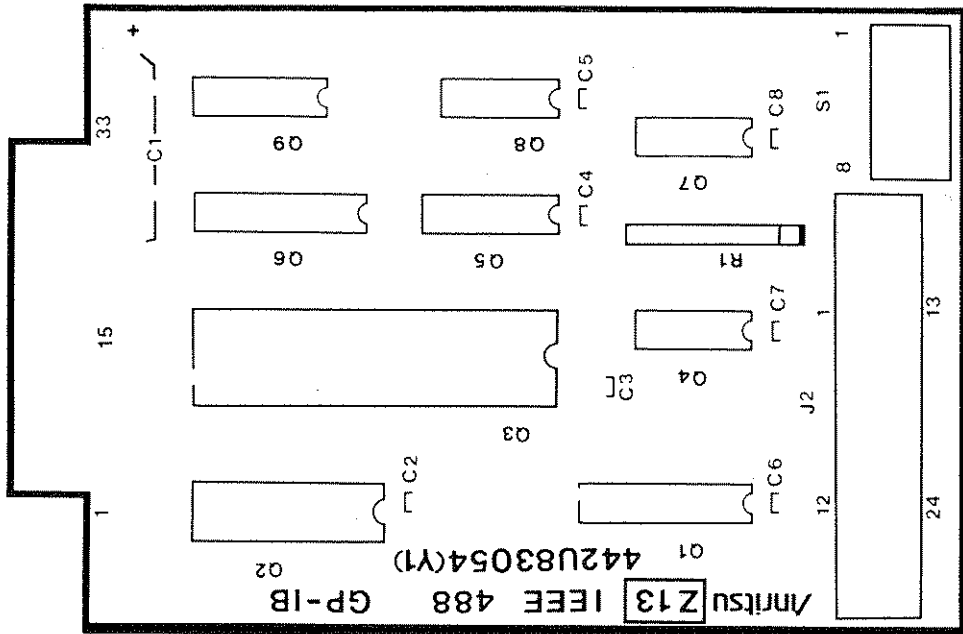
DEP

| | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|
| No. 0023-1985 08 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43W 33615 2/2 | 2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

| | | | | |
|----------------------------|----------|-------------|----------|--------|
| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| Z6 DISPLAY Circuit Diagram | | | | |
| DRAWING No. 43W33615 | | | | |
| ANRITSU CORP. 3-95/3-96 | | | | |

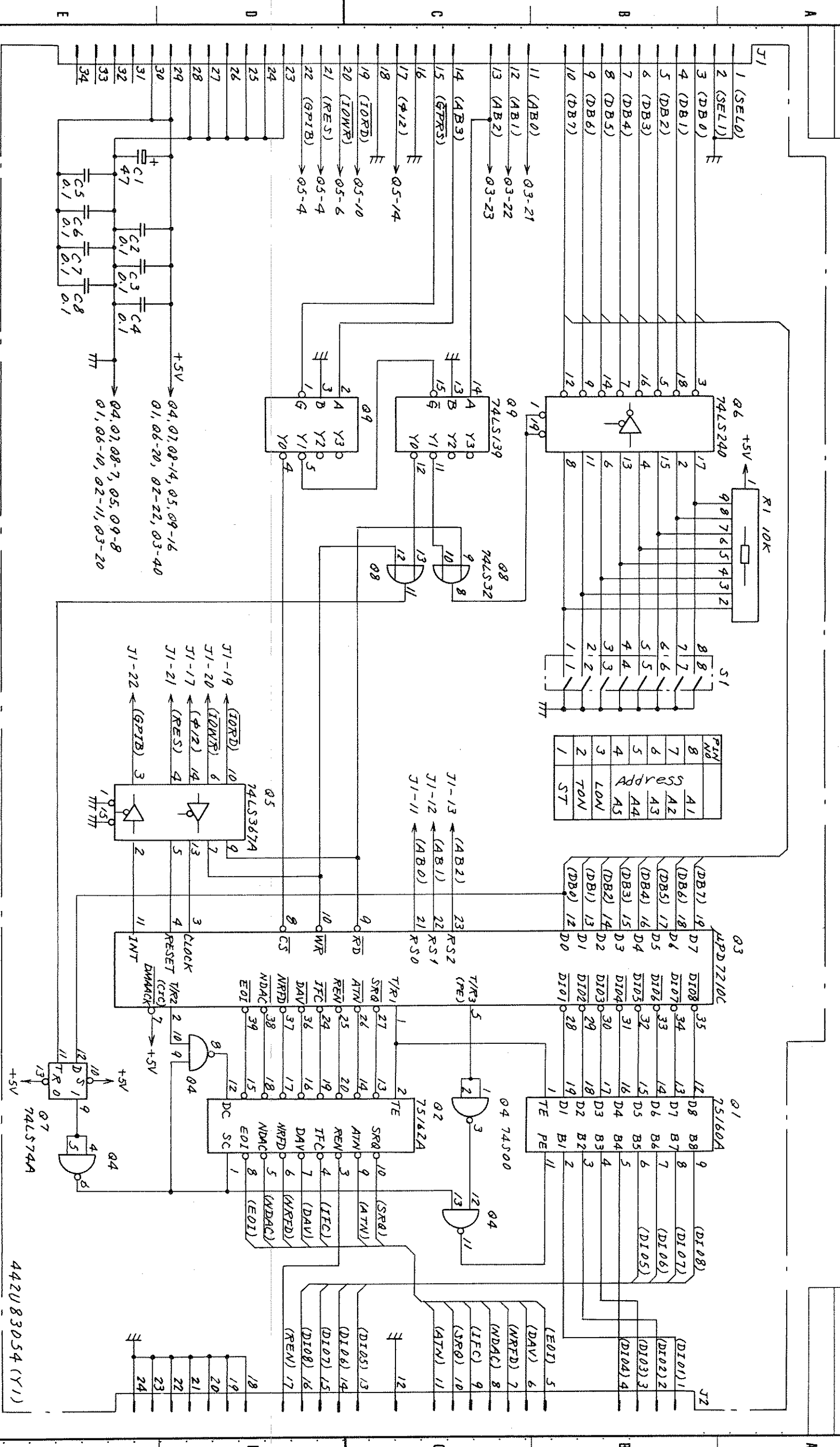
7

Fig. 3-34 Parts Layout of Z13 GP-IB
PC Board **8**



APPLICATION

REVISIONS



PARTS LIST 44W83046

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |

TITLE: Z/3 GP-1B
 Circuit Diagram

APPROVED BY: _____
 DRAWN BY: _____

No. 0023-1985-08

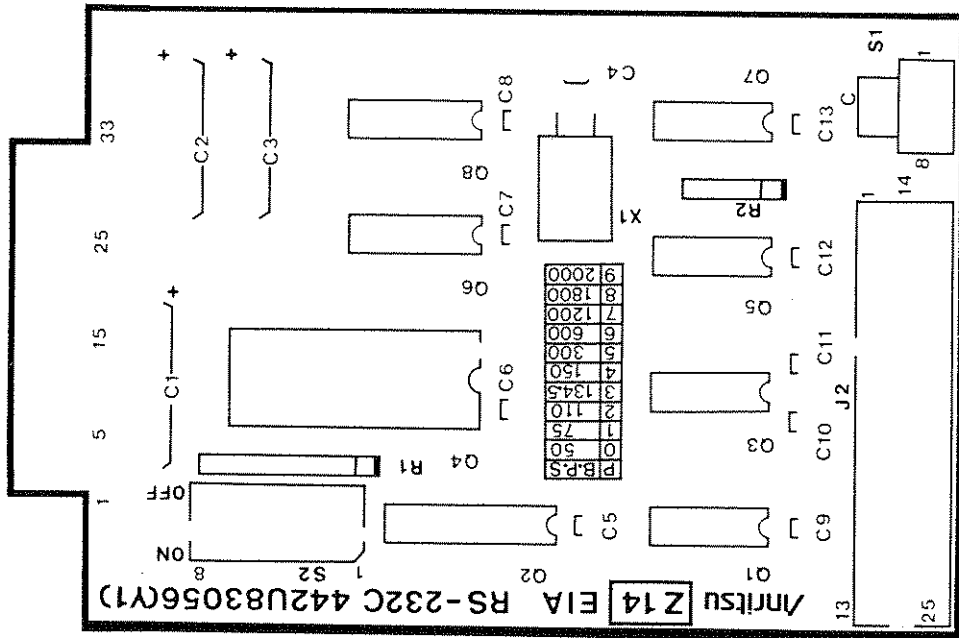
43W33432

ANRITSU CORP.

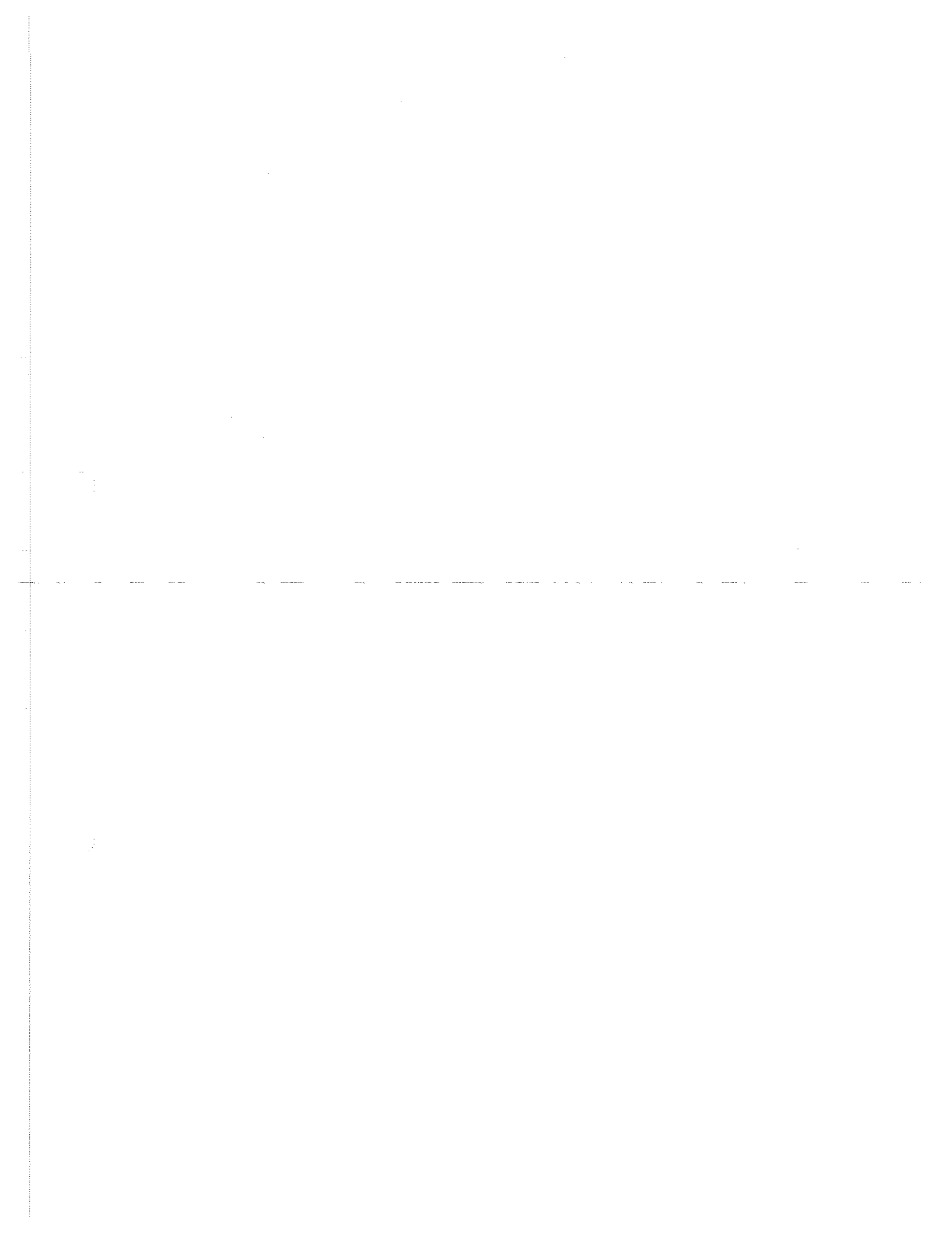
3-99/3-100

8

Fig. 3-35 Parts Layout of Z14 RS-232C
PC Board **9**

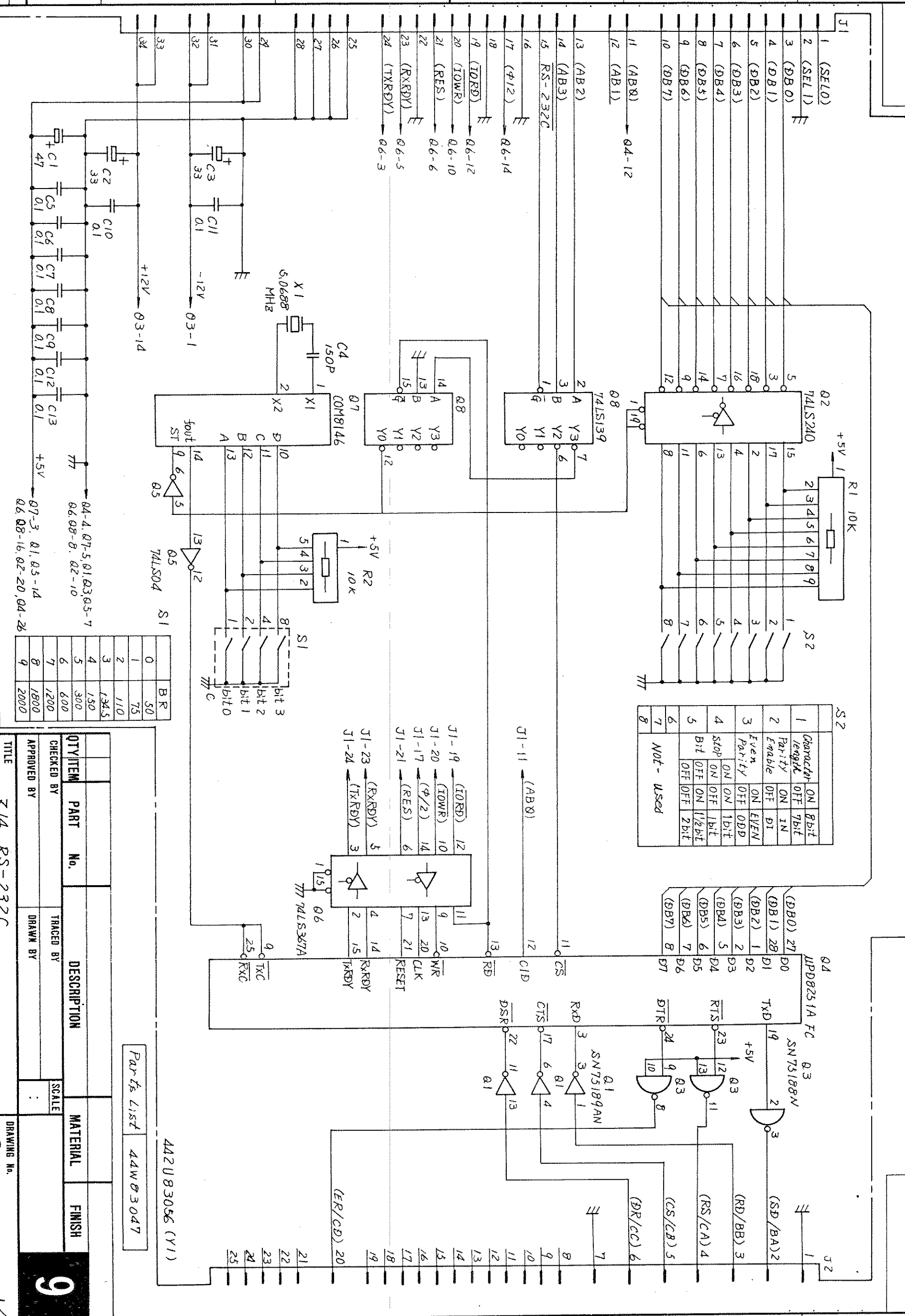


3-101/(3-102 blank)



APPLICATION

REVISIONS



No. 0023-1985.08

43W33433

1 2 3 4 5 6 7 8

DEP

43W33433

ANRITSU CORP.

3-103/3-104

442U83056 (Y1)

44W03047

Parts List

43W33433

3-103/3-104

3.6 MH677A Troubleshooting

Figure 3-36 shows MH677A, block diagram which consists of PC boards Z1 to Z6 and Z13 or Z14 (listed in Table 3-4). The PC board functions are outlined as follows. See 3.6.1 to 3.6.6 for details.

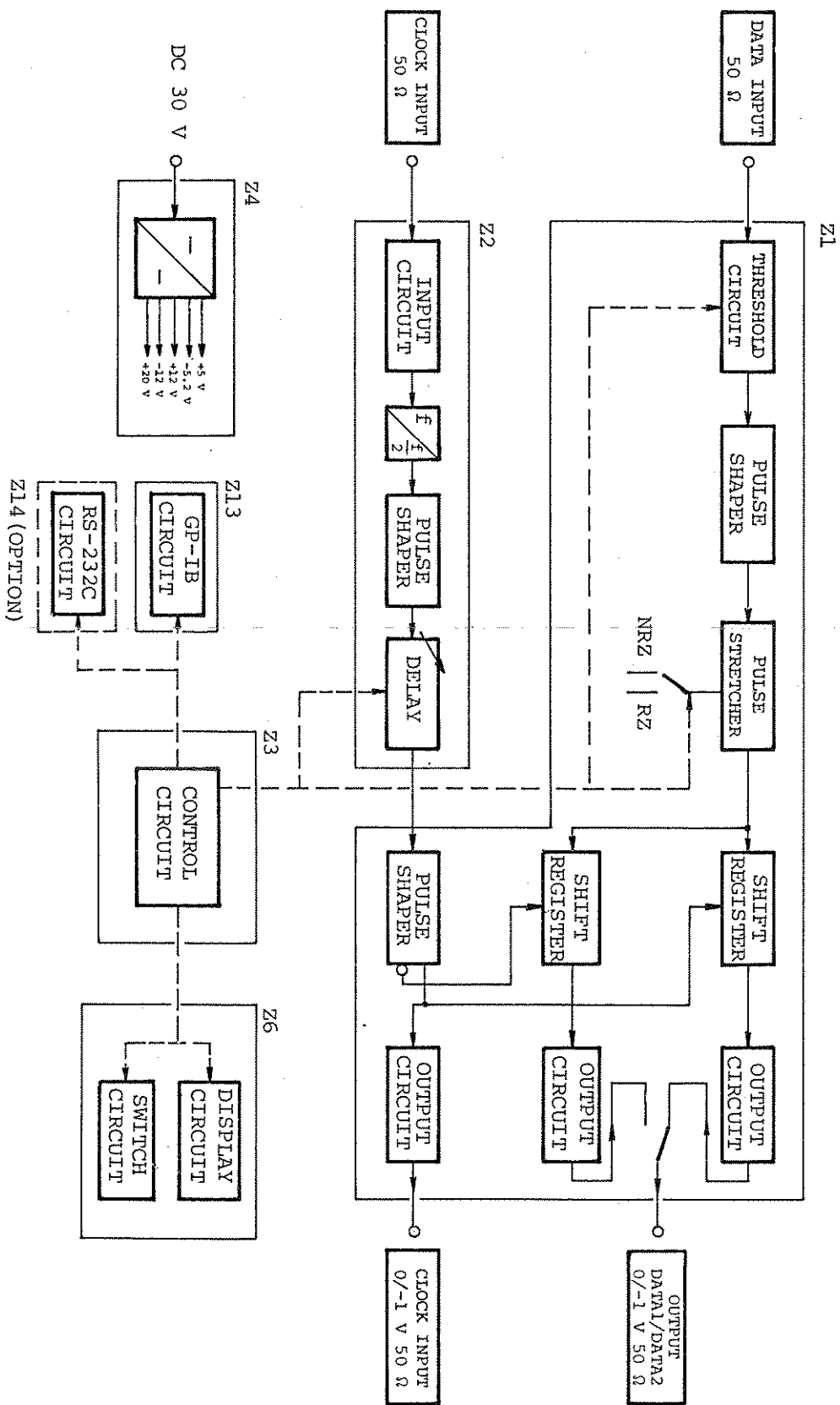


Fig. 3-36 MH677A DEMULTIPLEXER Block Diagram

The multiplexer input circuit receives DATA1 and DATA2, and CLOCK signals from the transmitter and doubles their speeds.

(4) Multiplexer input circuit (Z2)

This circuit also receives signals from the GP-IB or RS-232C circuit (Z13 or Z14) and converts them into control signals.

OUTPUT must be switched for input signal, and display signals are generated.

To generate display signals, DATA THRESHOLD and CLOCK PHASE ADJUST must be set and DATA FORMAT and

The control circuit receives switch operation signals from the display circuit (Z6) and converts them into control signals.

(3) Control circuit (Z3)

The power supply circuit generates various dc power voltages from the power received from the ME522A Receiver and Transmitter via the motherboard, and supplies the other PC boards.

(2) Power supply circuit (Z4)

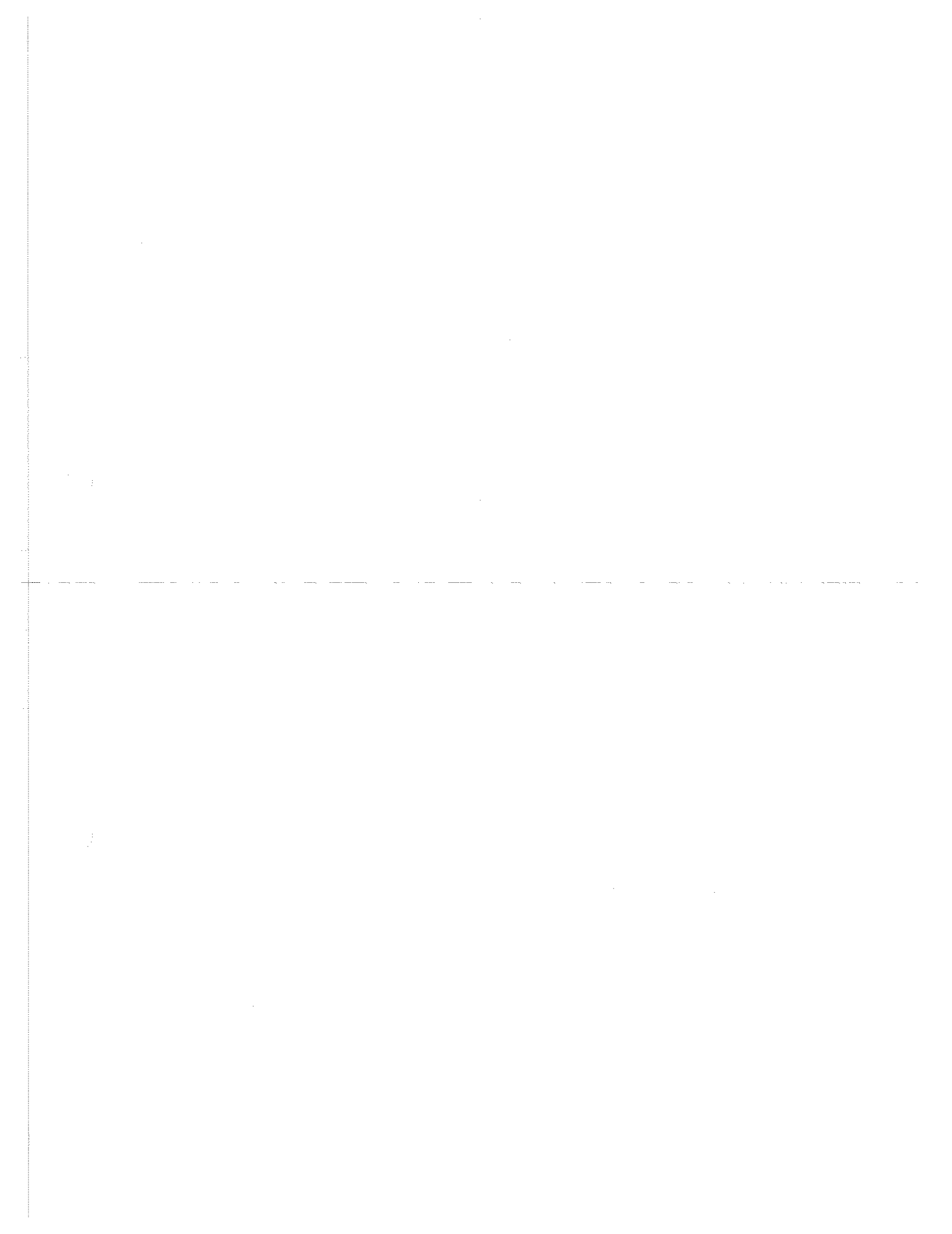
It also transfers power and control signals between PC board Z1 to Z3.

The motherboard circuit receives dc power from the ME522A Transmitter, and supplies the power supply circuit (Z4).

(1) Motherboard circuit (Z5)

- (5) Multiplexer output circuit (Z1)
The multiplexer output circuit receives DATA and CLOCK signals from the multiplexer input circuit, shapes the waveform, and changes the data format (NRZ/RZ). The signals are then output at variable AMPLITUDE and OFFSET levels.
- (6) Display circuit (Z6)
The display circuit displays the switch operation states and the AMPLITUDE and OFFSET levels according to control signals received from the control circuit.
- (7) GP-IB circuit (Z13) or RS-232C circuit (Z14)
The GP-IB or RS-232C circuit receives signals from the external controller and converts them into interface signals for the control circuit.
- Note:
See SECTION 2 for the mechanical configuration required for troubleshooting and adjustment.

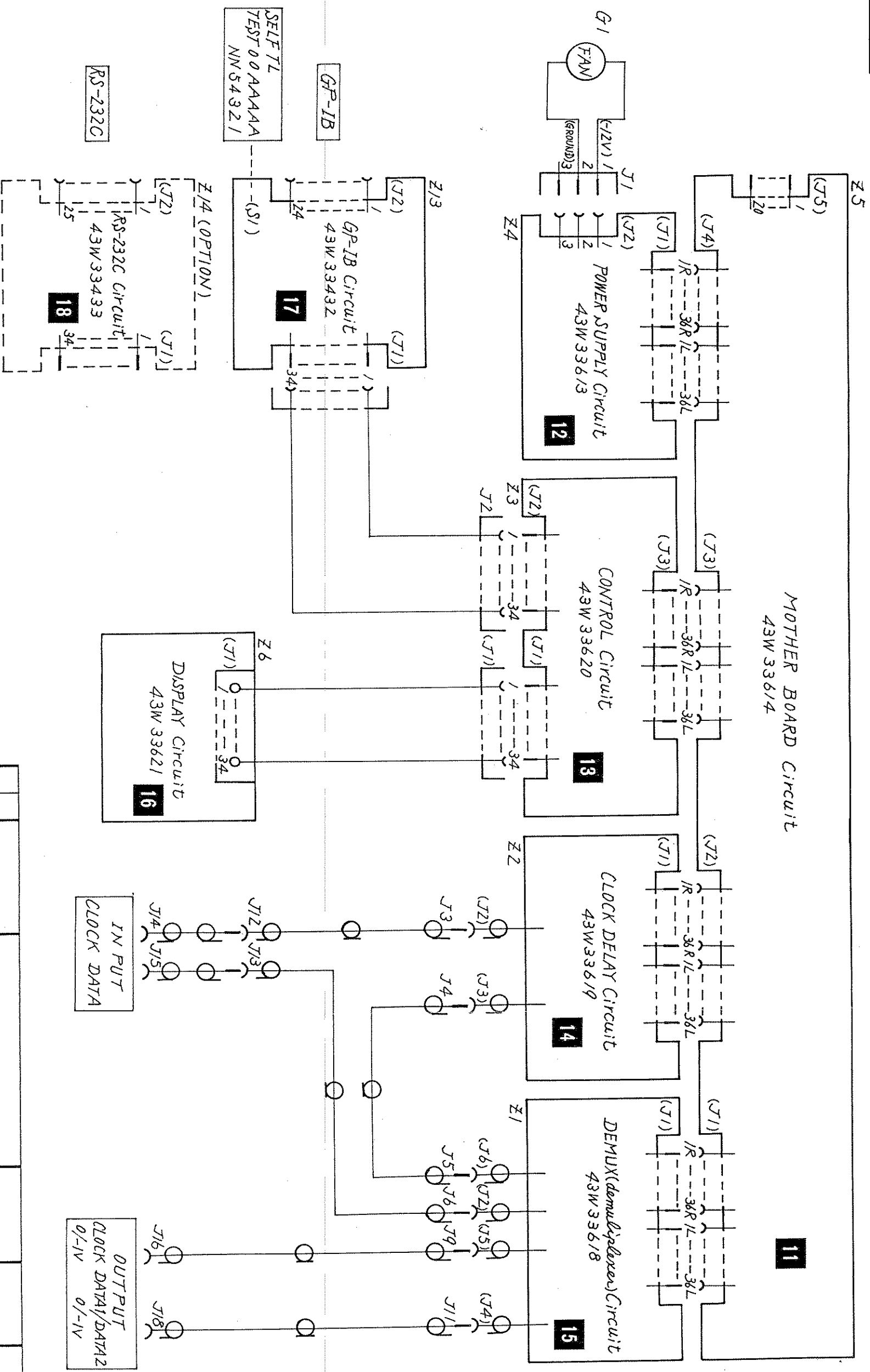
- (4) Clock delay circuit (Z2)
- The clock delay circuit receives CLOCK input signals from the device under test (DUT), divides it into half (1/2), shapes the pulse, and delays the phase within a range of approx. 1 ms.
- (5) Demultiplexer circuit (Z1)
- The demultiplexer circuit receives DATA input signals from the DUT. After passing through the threshold circuit, pulse shaper, and pulse stretcher, the signals are retimed using CLOCK signals sent from the clock delay circuit for output as the DATA1 and DATA2 signals. DATA1 and DATA2 are switched to OUTPUT to enable signal input to the ME522A Receiver with the CLOCK output signals.
- (6) Display circuit (Z6)
- The display circuit displays the switch operation states, CLOCK PHASE ADJUST, and DATA THRESHOLD according to control signals send from the CONTROL circuit.
- (7) GP-IB circuit (Z13) or RS-232C circuit (Z14)
- The GP-IB or RS-232C circuit receives signals from an external controller and converts them into interface signals for the control circuit.
- Note:
- See SECTION 2 for the mechanical configuration required for troubleshooting.



APPLICATION

REVISIONS

MOTHER BOARD Circuit 43W 33614



Parts List 44W 83356

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |
| | | | | | |

10

TITLE DE MULTIPLEXER(DEMUX) MH 677A
Circuit Diagram

CHECKED BY
APPROVED BY

TRACED BY
DRAWN BY *Miyabuchi*

SCALE

DRAWING No. 43W 33617

ANRITSU CORP.

No. 0023-1985-08

43W 33617 1/1

2

3

4

5

6

7

8

3-111

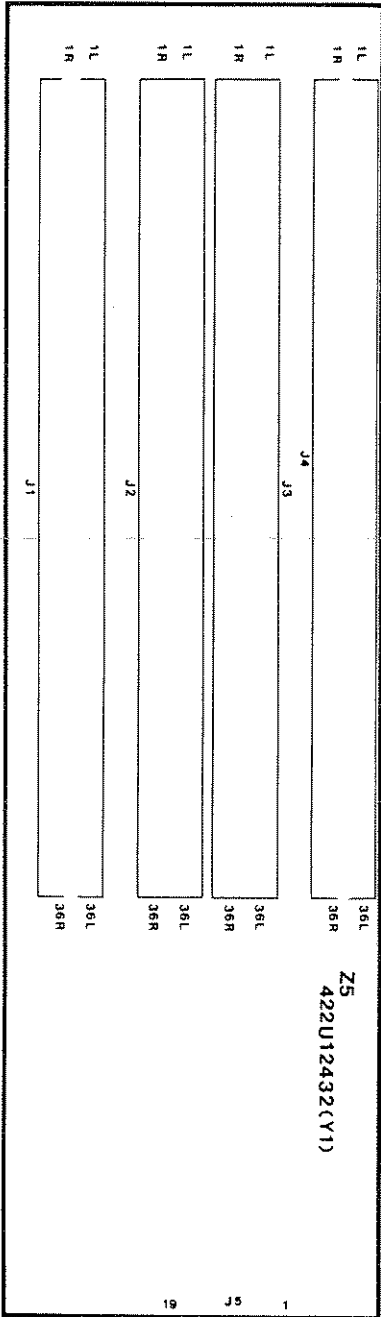
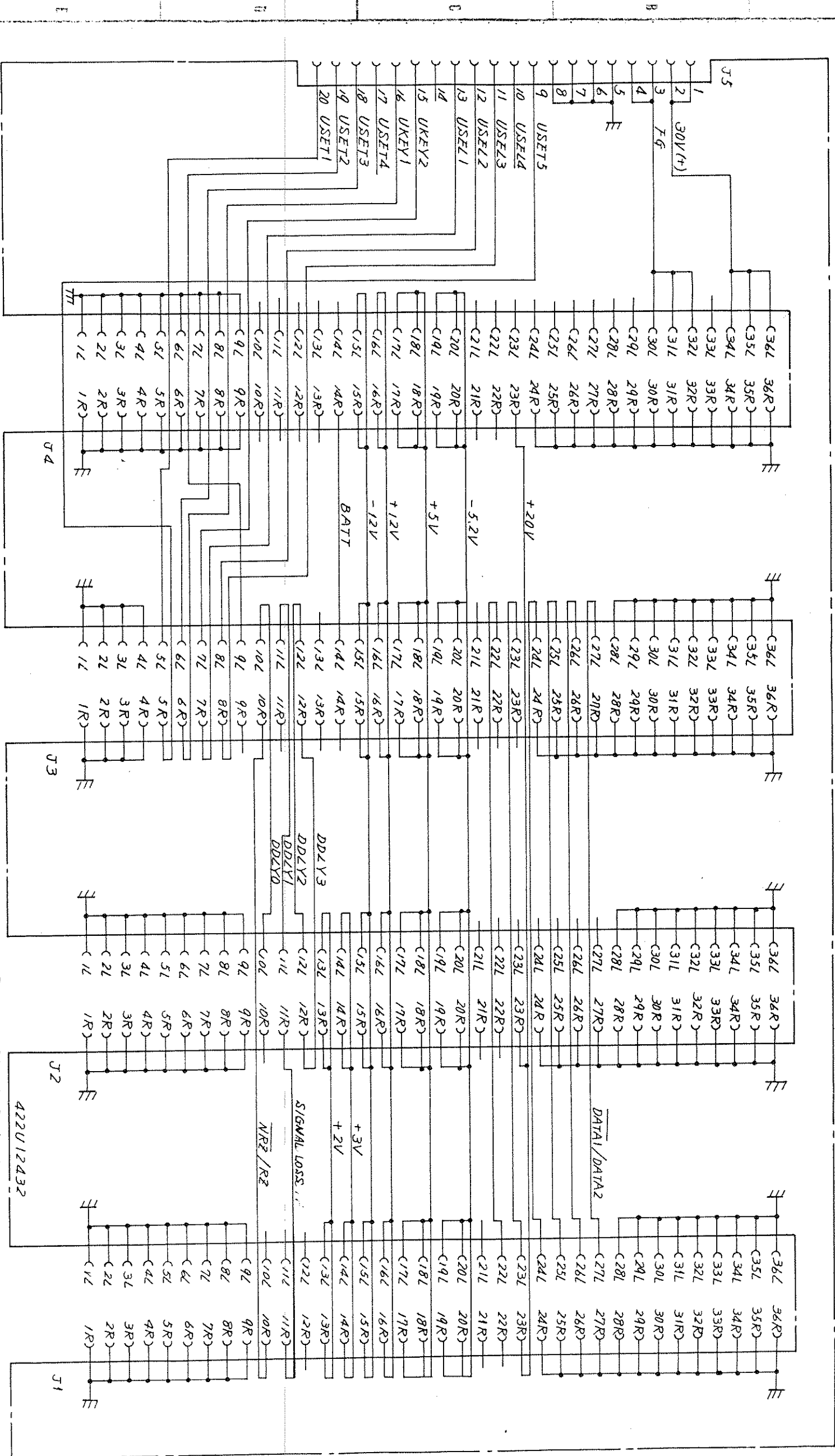


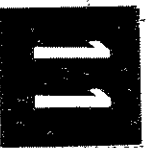
Fig. 3-37 Parts Layout of Z5 Motherboard PC Board





APPLIC: 43W33614 1/1
 DATE: 1984-04
Parts List 44W83354
POWER SUPPLY
CONTROL

QTY ITEM PART No. DESCRIPTION MATERIAL PARTS
 CHECKED BY: *Nguyen & Ashie*
 DRAWN BY: *Nguyen & Ashie*
43W33614
Z5 MOTHER BOARD Circuit Diagram
ANRITSU CORP.
 DRAWING NO. 3-113/3-114



43W33614 1/1 2 2 3 3 4 4 5 5 6 6 7 7 8 8

(1) Fuse replacement

Pull the MH677A out from the ME522A Receiver and remove the top cover according to the instructions given in paragraph 2.1.

Remove fuses F1 to F5 from the fuse holders on the Z4 PC board and replace them with new fuses (Fig. 3-38).

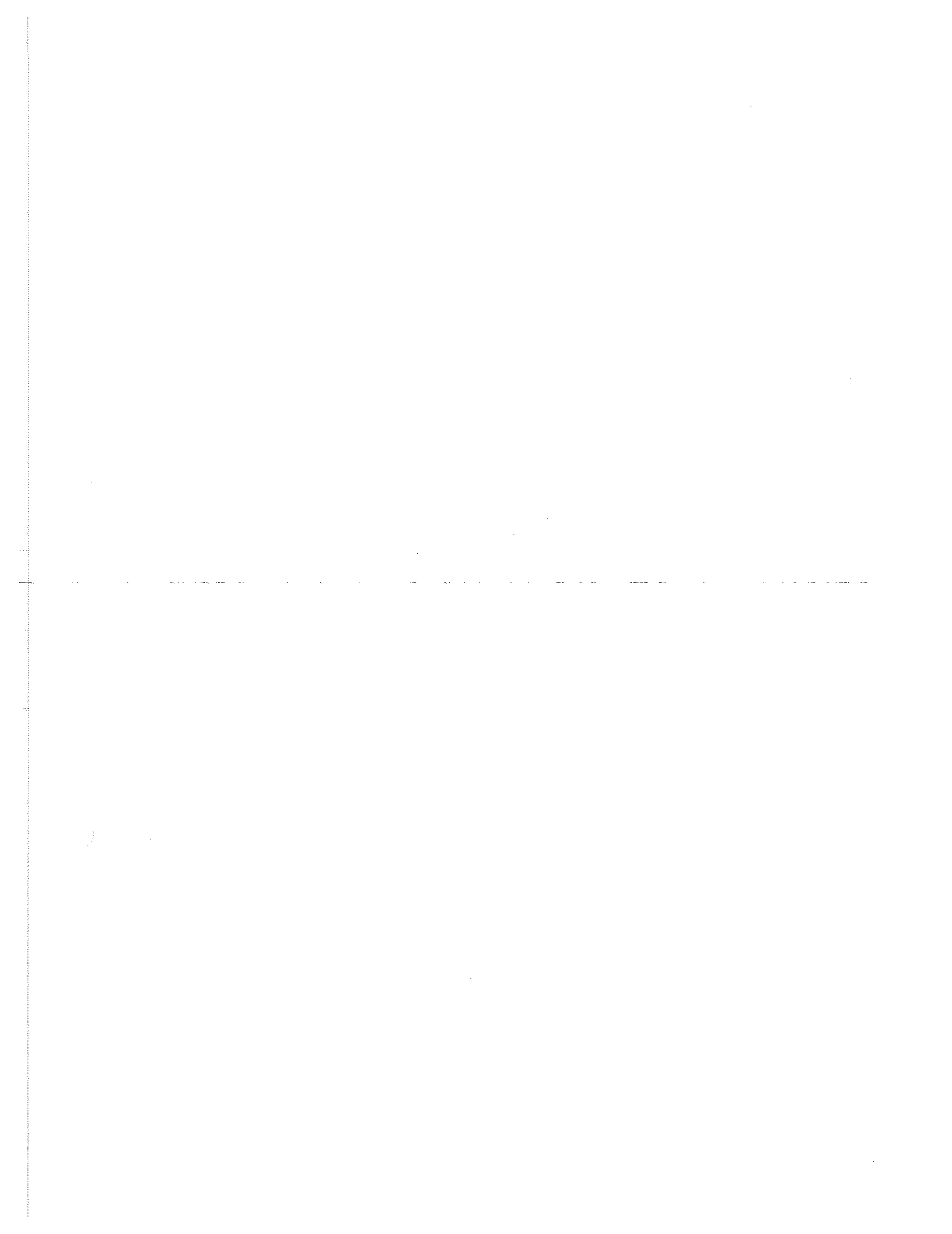
(2) Troubleshooting

(a) Disconnect J2 to J6, J9, and J11 of the MH677A from J2 and J4 to J6 of PC board Z1, J2 and J3 of PC board Z3, and J1 and J2 of PC board Z3.

(b) Disconnect PC boards Z1 to Z3 from J1 to J3 of PC board Z5.

(c) Remove the PC board Z4 and insert the extender board where PC board Z4 was mounted then connect Z4 to the extender board.

(d) See items (d) to (k) in paragraph 3.5.2, MH676A Troubleshooting, for details of troubleshooting.



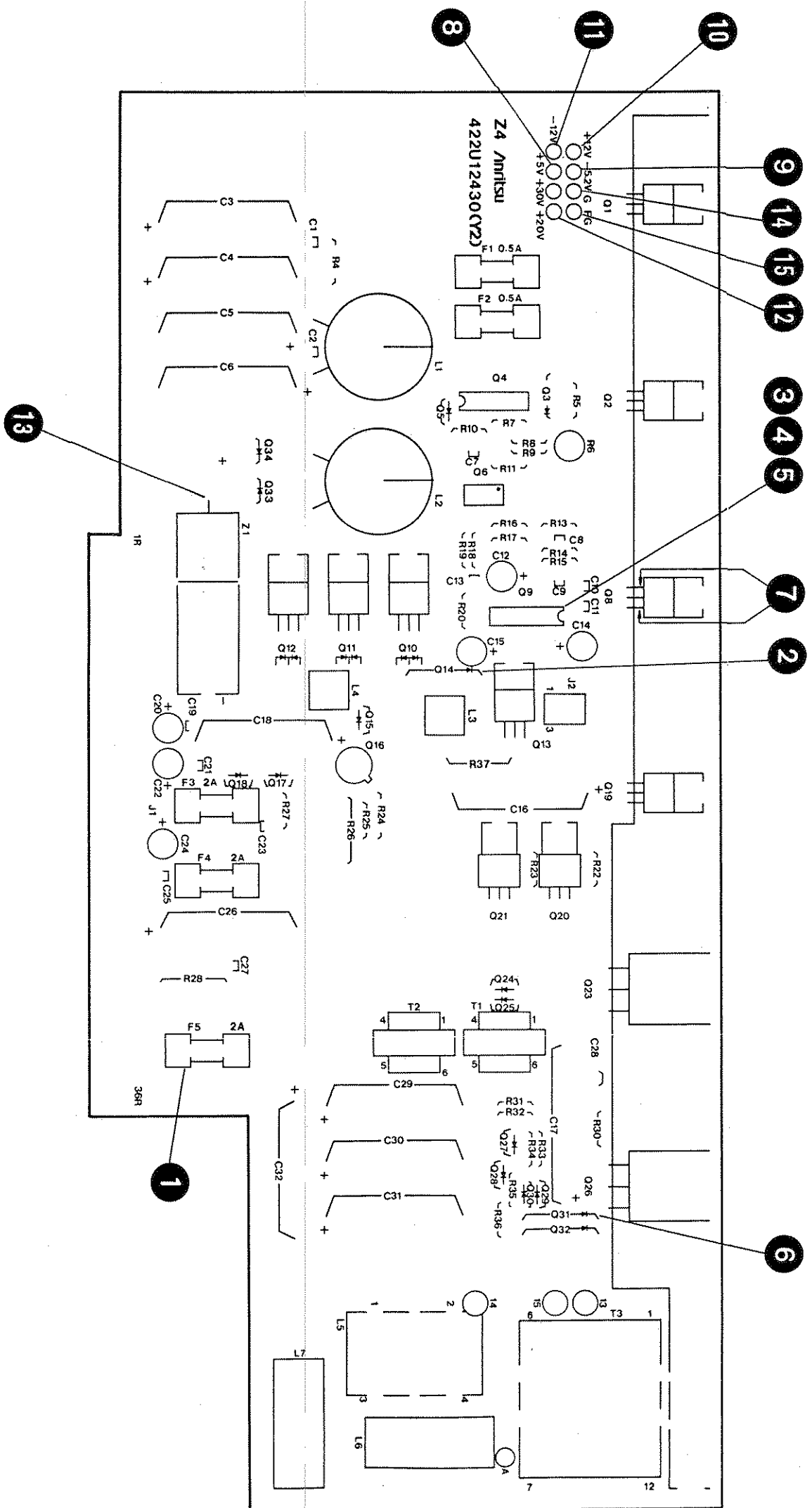
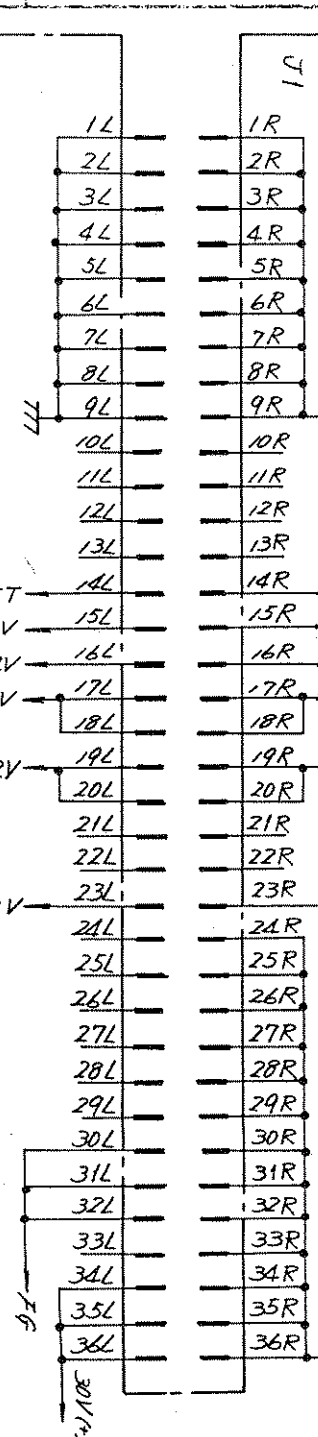
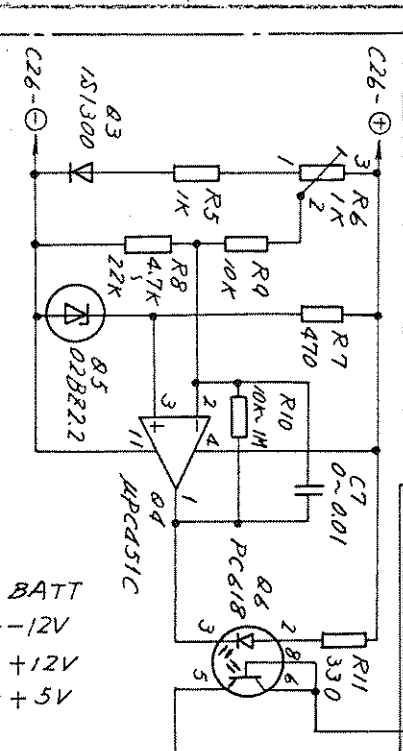
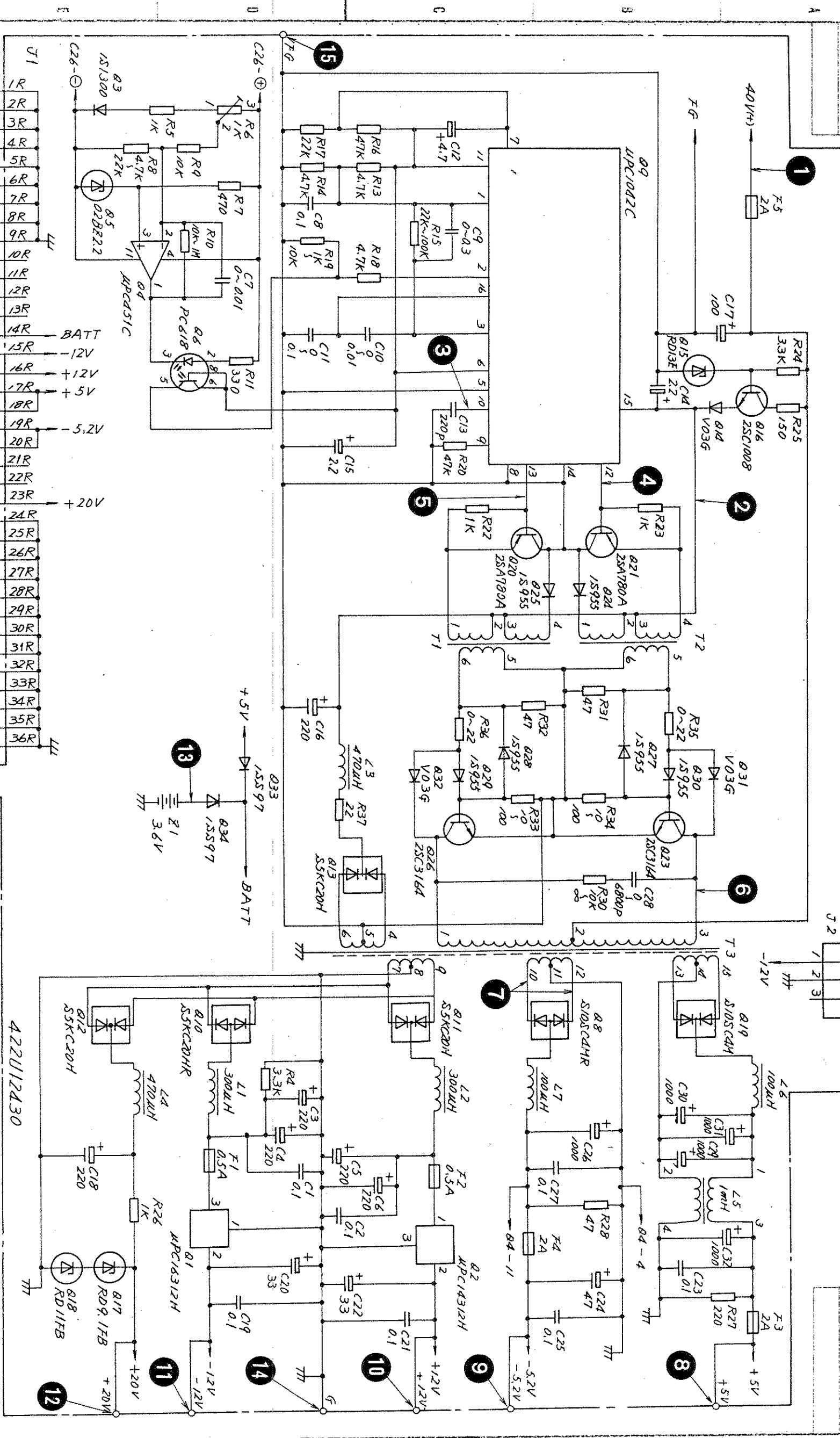


Fig. 3-38
 Parts Layout of MH677A Z4
 Power Supply PC Board **12**

APPLICATION

REVISIONS



Parts List 44W 83353

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|---------------------------|----------|-------------|----------|--------|
| APPROVED BY _____ | | | | |
| CHECKED BY _____ | | | | |
| DRAWN BY <i>Miyabuchi</i> | | | | |
| SCALE _____ | | | | |
| DRAWING No. 43W33613 | | | | |

Z4 POWER SUPPLY Circuit Diagram

12

The above table lists the standard values. The tolerance range is $\pm 10\%$. If the voltages are normal, no troubleshooting is required. If the voltages are abnormal, troubleshoot the circuits for Q10, Q11, and Q12.

(c) Check the dc voltage, at Z3 test point ⑥ (pins 12, 14, 16, and 18 or Q18). If the voltages are normal, no troubleshooting is required. If the voltages are abnormal, troubleshoot the circuits for Q15 and Q18.

| DATE THRESHOLD | | Panel setting |
|----------------|--------|---------------|
| +3.5 V | -0.5 V | ⑥ |
| 2.9 V | 1.35 V | |

Table 3-13 Dc voltages at Z3 Test Point ⑥

- (1) Troubleshooting
- (a) See Items (a) to (d) in paragraph 3.5.3, MH676A Troubleshooting, for details of troubleshooting.
- (b) Measure the dc voltage at Z3 test point ⑥ with the panel set as follows:

H is +2.4 V or more
L is +0.4 V or less

Notes:

| Panel Setting | | | |
|---------------|----|----|----|
| 12 | 14 | 16 | 18 |
| -5 | L | L | L |
| -4 | H | L | L |
| -3 | L | H | L |
| -2 | H | H | L |
| -1 | L | L | L |
| 0 | H | L | L |
| 1 | L | H | L |
| 2 | H | H | L |
| 3 | L | L | H |
| 4 | H | L | H |
| 5 | L | H | H |

CLOCK PHASE
ADJUST
X 100ps

Table 3-14 DC Voltages at Z3 Test Point ⑩

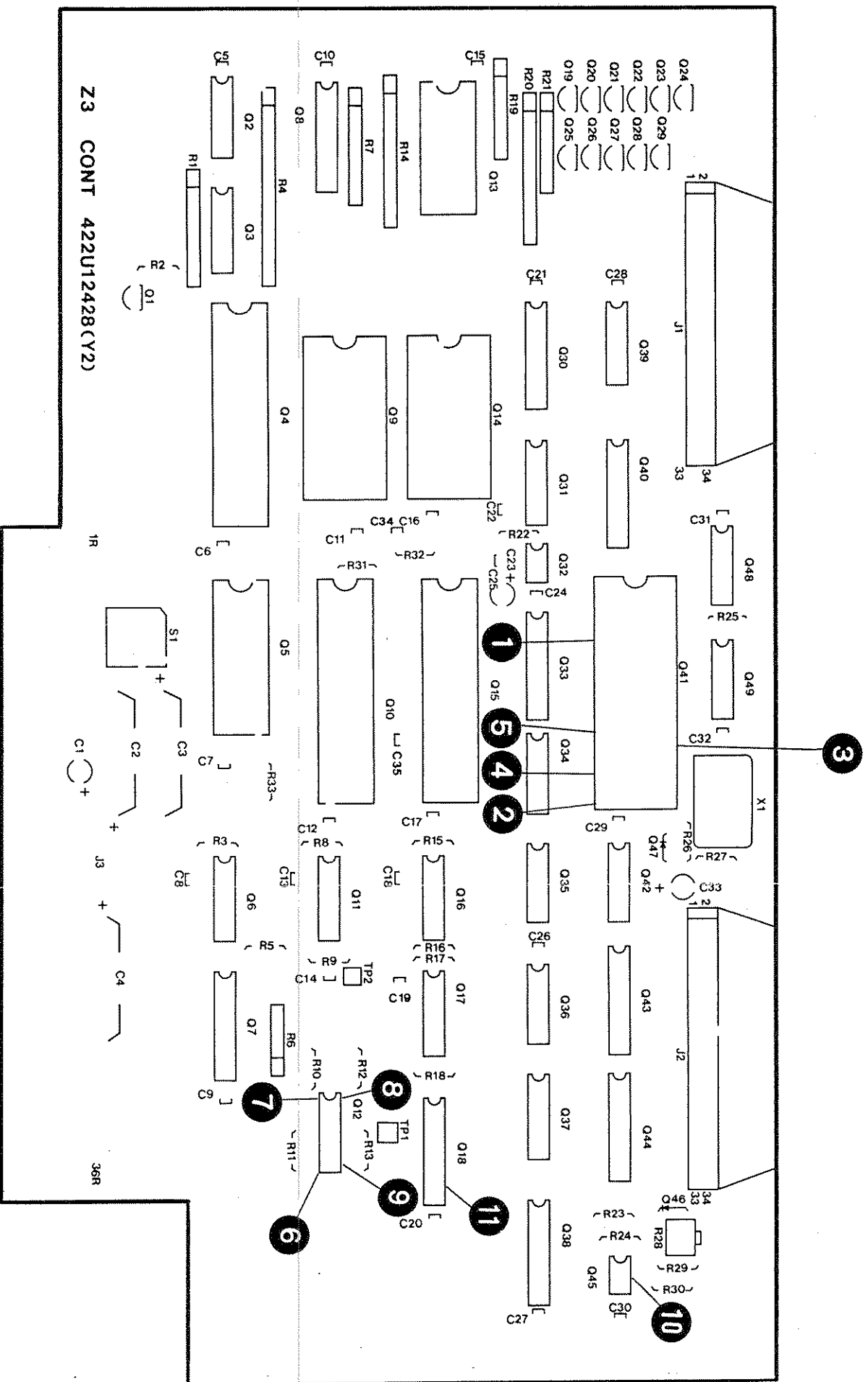
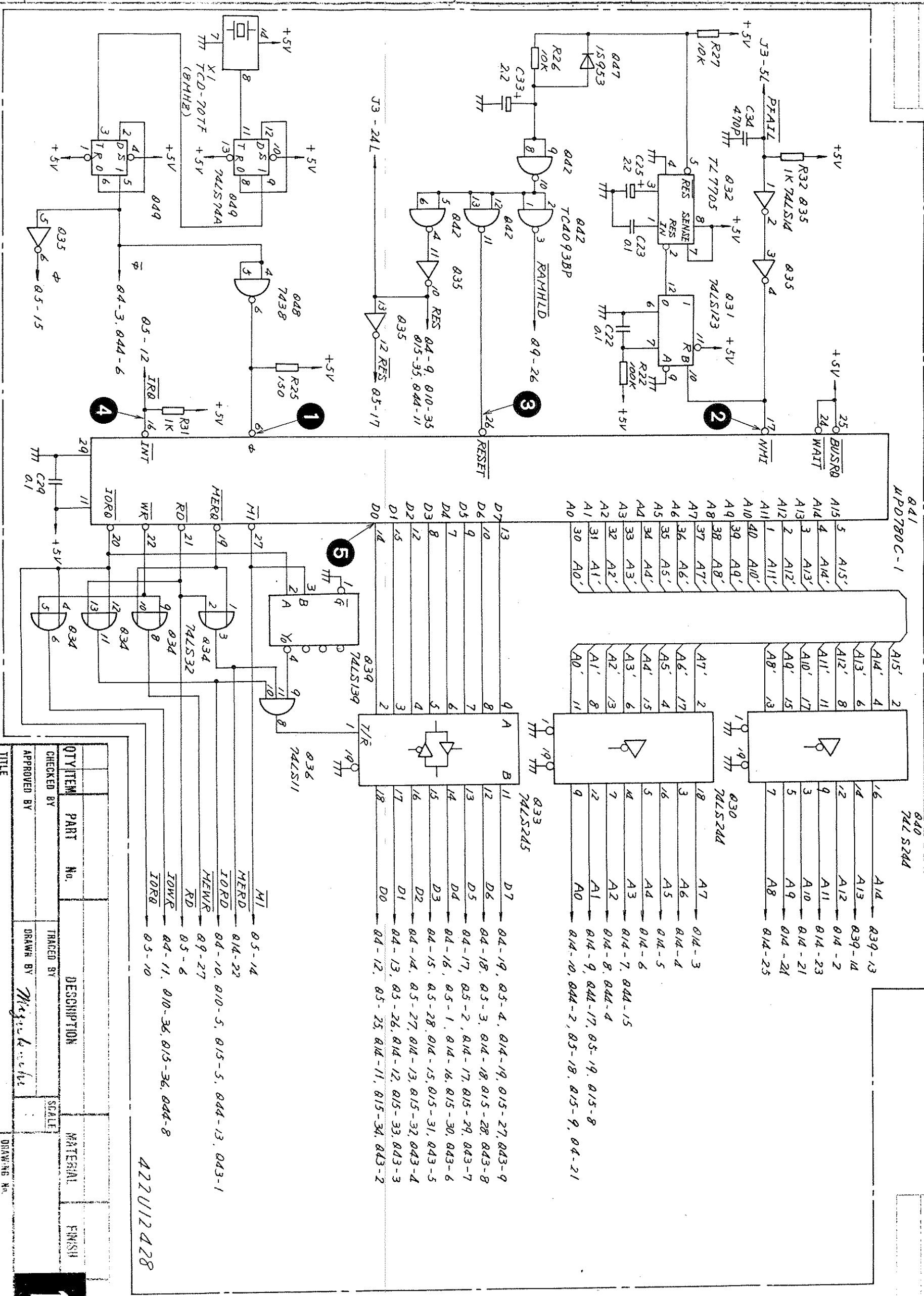


Fig. 3-39
 Parts Layout of MH677A Z3
 Control PC Board **13**
 3-121/(3-122 blank)

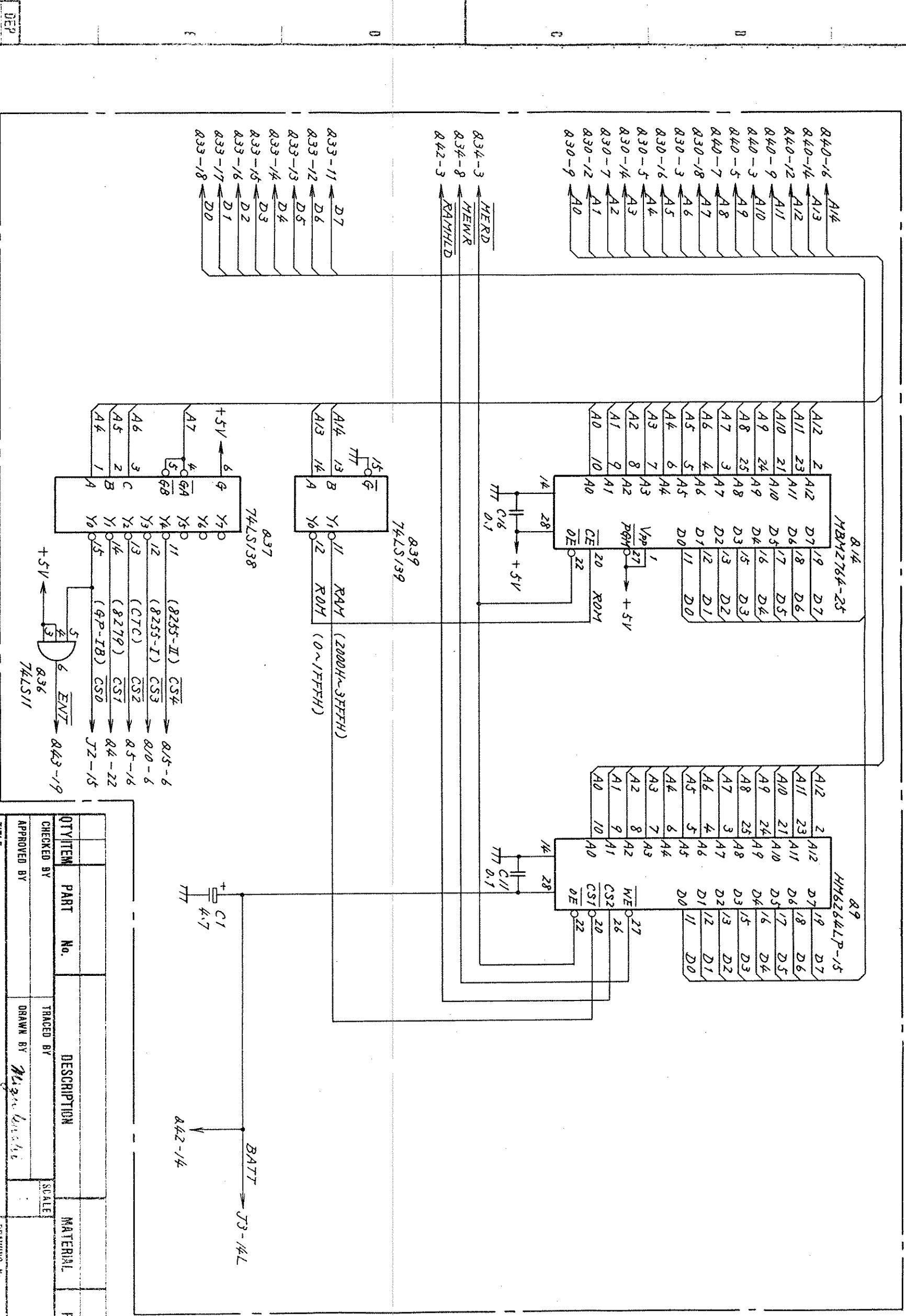
APPLICATION

REVISIONS



| 43W33612 1/6 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | |
|---|--------------|----------|-------------|----------|--------|---|---|---------------|-------------|----------------------------|--------------|----------|--------|--|--|--|--|--|--|
| <table border="1"> <tr> <th>QTY</th> <th>ITEM</th> <th>PART No.</th> <th>DESCRIPTION</th> <th>MATERIAL</th> <th>FINISH</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | | QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH | | | | | | |
| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>APPROVED BY</td> <td>TRACED BY</td> <td>SCALE</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | | APPROVED BY | TRACED BY | SCALE | | | | | | | | | |
| APPROVED BY | TRACED BY | SCALE | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>TITLE</td> <td>DRAWING No.</td> </tr> <tr> <td>Z3 CONTROL Circuit Diagram</td> <td>43W33612 1/6</td> </tr> </table> | | | | | | | | TITLE | DRAWING No. | Z3 CONTROL Circuit Diagram | 43W33612 1/6 | | | | | | | | |
| TITLE | DRAWING No. | | | | | | | | | | | | | | | | | | |
| Z3 CONTROL Circuit Diagram | 43W33612 1/6 | | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>ANRITSU CORP.</td> <td>3-123/3-124</td> </tr> </table> | | | | | | | | ANRITSU CORP. | 3-123/3-124 | | | | | | | | | | |
| ANRITSU CORP. | 3-123/3-124 | | | | | | | | | | | | | | | | | | |

13



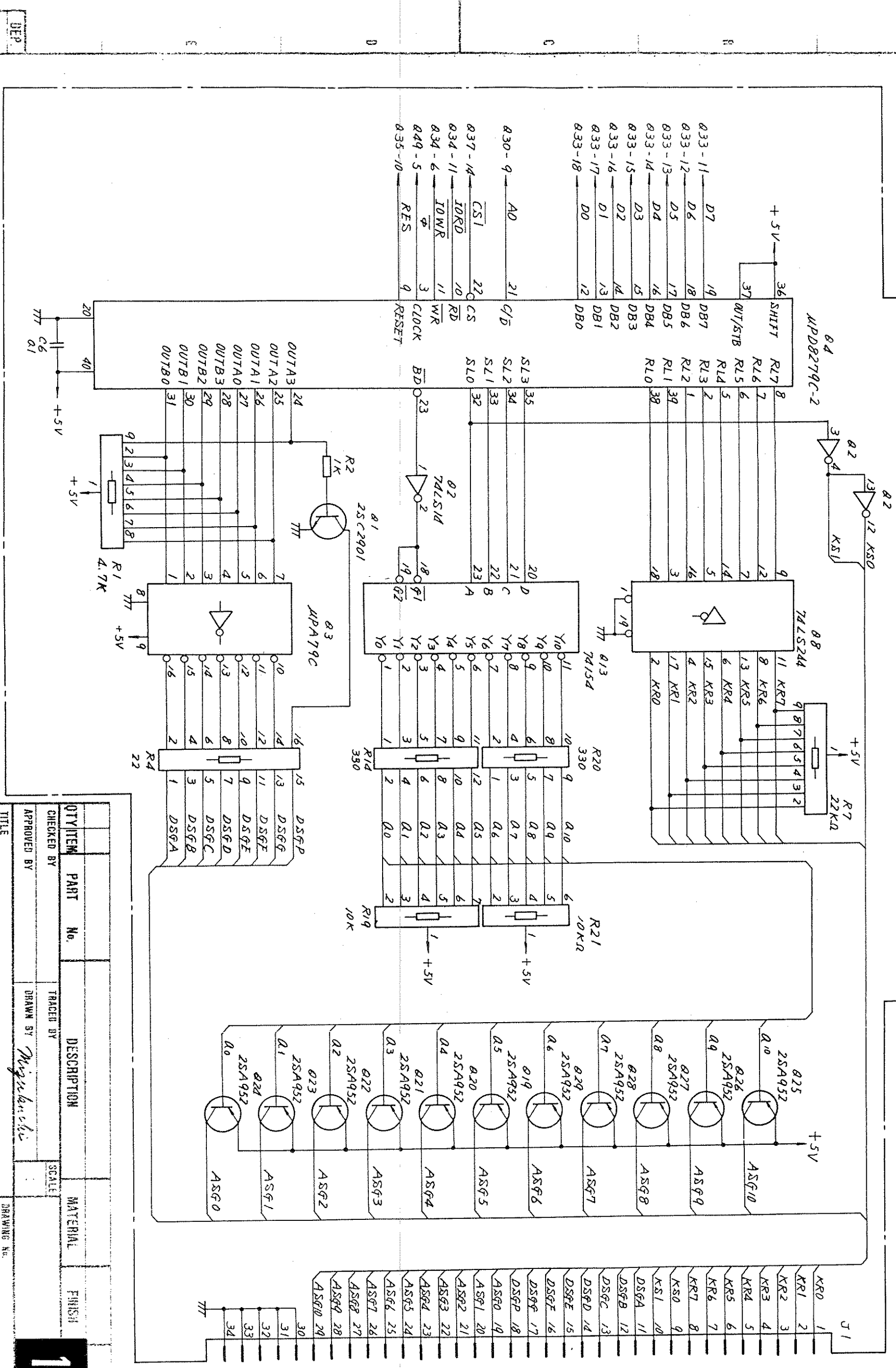
| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

TITLE: Z3 CONTROL Circuit Diagram.
 DRAWING No: 43W33612 2/6
 ANRITSU CORP. 3-125/3-126

13

APPLICATION

REVISIONS



(DISPLAY Circuit)

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------|----------|-------------|----------|--------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

TITLE
Z3 CONTROL Circuit Diagram

DRAWING No.
43W33612

13

43W33612 3/6

2

3

4

5

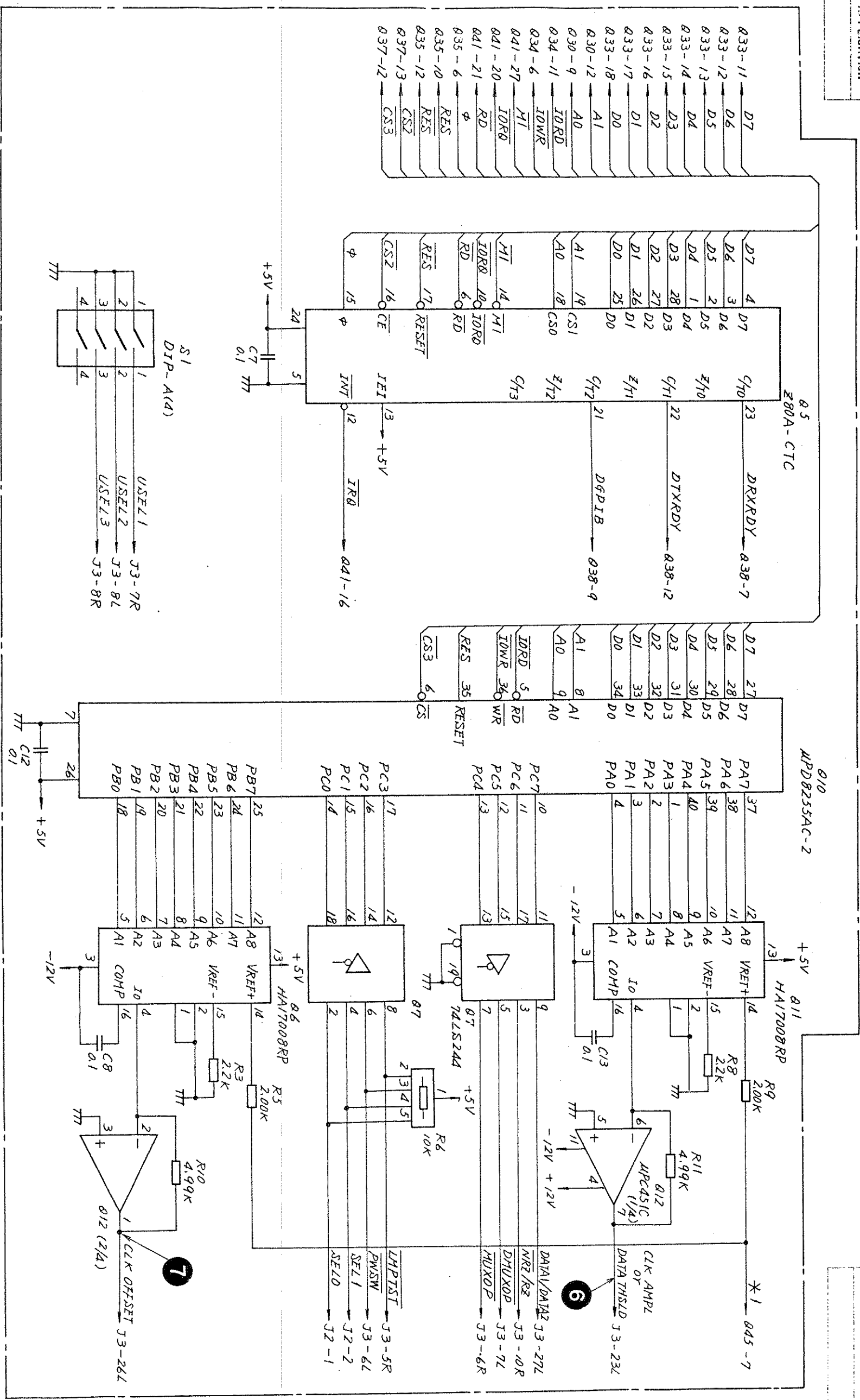
6

7

8

3-127/3-128

DEP



Note: Switch S1 Setting

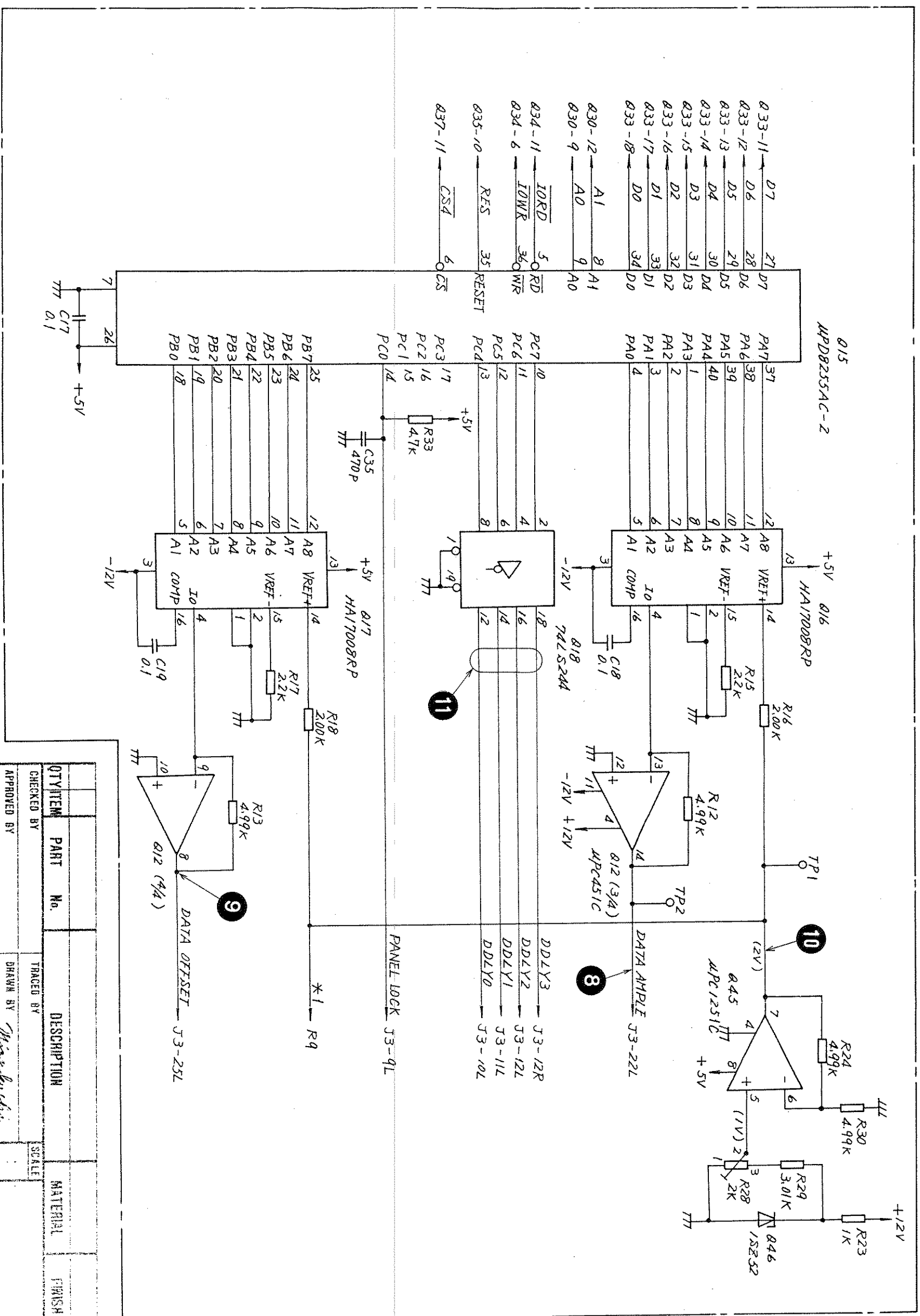
| S1 Switch Unit | NO | 1 | 2 | 3 |
|----------------|-----|----|----|----|
| HH 676A | ON | ON | ON | ON |
| HH 677A | OFF | ON | ON | ON |

| | | | | |
|-----------------------------|----------|-------------|----------|--------|
| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| CHECKED BY | | | | |
| APPROVED BY | | | | |
| DRAWN BY <i>Thy...skaki</i> | | | | |
| SCALE | | | | |
| DRAWING No. | | | | |

TITLE: **Z3 CONTROL Circuit Diagram**

43W33612

ANRITSU CORP. 3-129/3-130

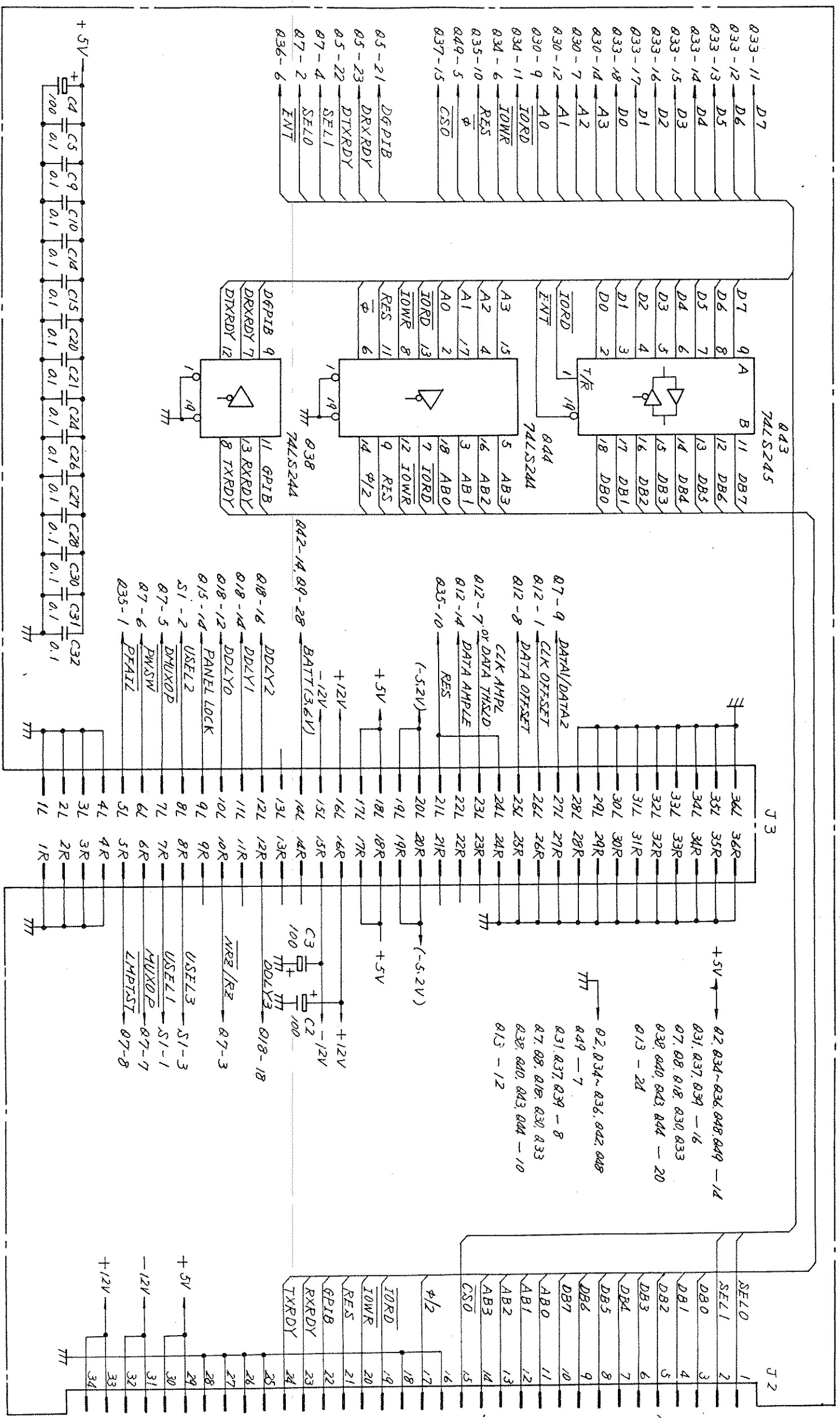


DEP

No. 0023 1065 08

| | | | | | | | | |
|--|-----|---|-----------------------------|---|---|------------------------|---|---|
| 43W33612 | 5/6 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| <p>33 CONTROL Circuit Diagram</p> <p>ANRITSU CORP. 3-131/3-132</p> | | | | | | | | |
| <p>QTY ITEM PART No. DESCRIPTION</p> | | | <p>CHECKED BY TRACED BY</p> | | | <p>MATERIAL FINISH</p> | | |
| <p>APPROVED BY</p> | | | <p>SCALE</p> | | | <p>DRAWING No.</p> | | |
| <p>DRAWN BY <i>Miyabuchi</i></p> | | | <p>43W33612</p> | | | <p>5</p> | | |

13



QEP

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|----------------------------|----------|--------|
| | | | CHECKED BY | | |
| | | | TRACED BY | | |
| | | | APPROVED BY | | |
| | | | DRAWN BY | | |
| | | | SCALE | | |
| | | | TITLE | | |
| | | | Z3 CONTROL Circuit Diagram | | |
| | | | DRAWING No. 43W33612 | | |
| | | | ANRITSU CORP. 3-133/3-134 | | |

13

No. 0023-1985-08

43W33612 6/8

2

3

4

5

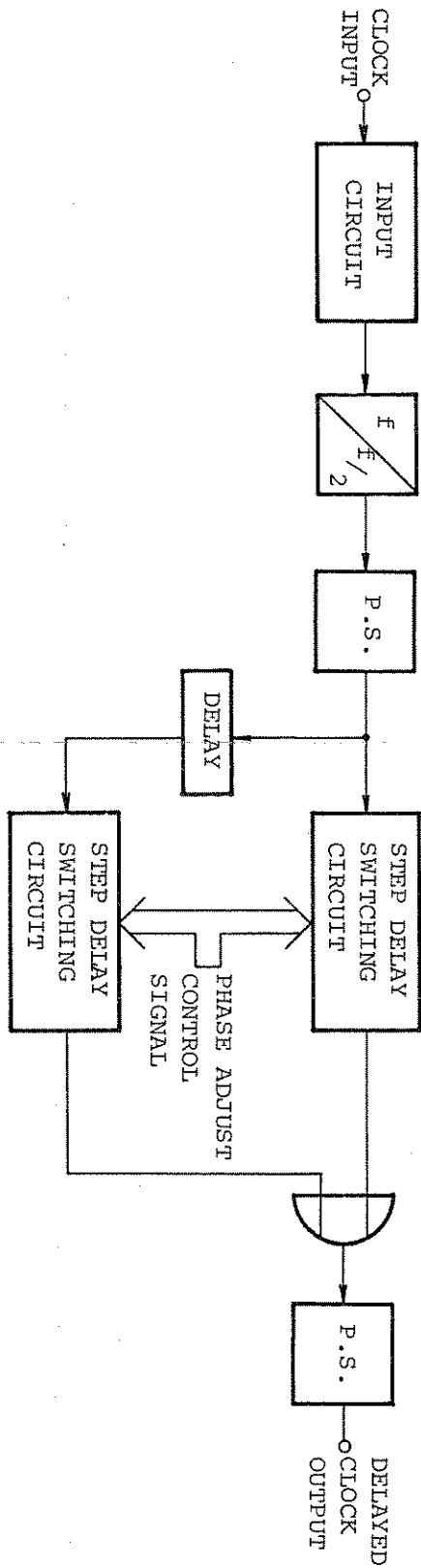
6

7

8

Figure 3-40 shows the Z2 Clock delay circuit block diagram. The CLOCK input signal is shaped and divided in half in the input circuit. The divided signal is branched into two signals, and the pulse is shaped for input to the step delay switching and delay circuits. The signal input to the delay circuit is transferred to the other step delay switching circuit. The step delay switching circuit is set by a phase adjustment control signal sent from the control PC board to generate a clock signal delayed in steps of approx. 100 ps. The signal is output after pulse-shaping.

(1) Circuit description



P.S.: Pulse shaper

Fig. 3-40 MH677A Z2 CLOCK DELAY Block Diagram

(2) Troubleshooting

(a) Disconnect all connectors connected to J2 and J3 of PC board Z2.

Remove the PC board Z2 and insert the extender board where the Z2 PC board was mounted. Then connect Z2 to the extender board.

Connect the DATA OUTPUT terminal of the MH676A to J2 of the MH677A PC board Z2 with a cable (SMA-P-RG58A/U-SMA-P 1 m coaxial cable).

(b) Setting ME522A Transmitter, MH676A, and MH677A

1. ME522A Transmitter

Frequency: 350 MHz

PATTERN : PRBS 2³-1

LOAD : 50 Ω

LOGIC : Normal

2. MH676A

Turn the power on with the LOCAL key held down to initialize the MH676A.

3. MH677A

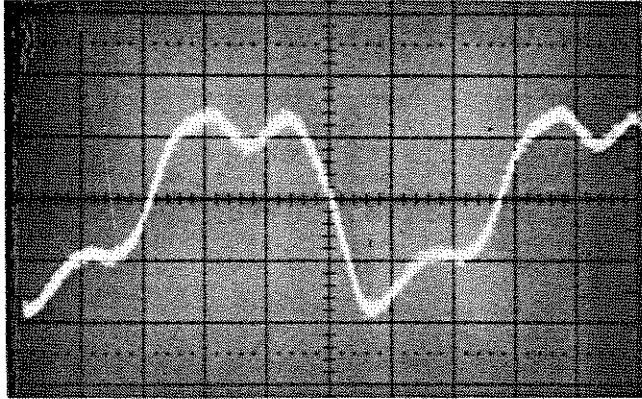
Turn the power on with the LOCAL key held down to initialize the MH677A.

(c) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ①.

If the waveform is as shown in Fig. 3-41, go to the next step. If the waveform is abnormal, troubleshoot the circuits for J2, Q4, and Q6, and the peripheral circuits.

Fig. 3-42 Waveform at Z3 Test Point ②

H: 0.5 ns/div
V: 0.2 V/div



(a) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ②. If the waveform is as shown in Fig. 3-42, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q7 and Q8, and the peripheral circuit.

Fig. 3-41 Waveform at Z2 Test Point ①

H: 0.5 ns/div
V: 0.5 V/div

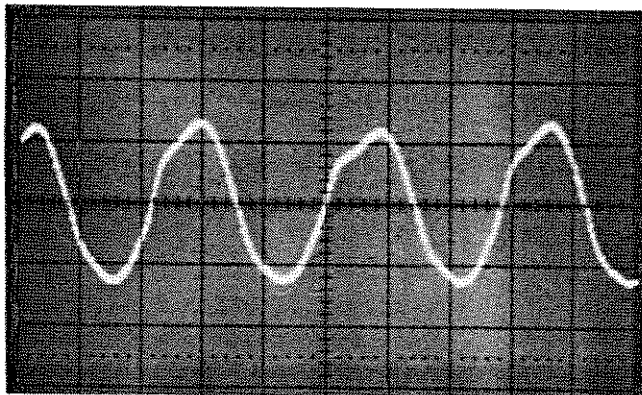
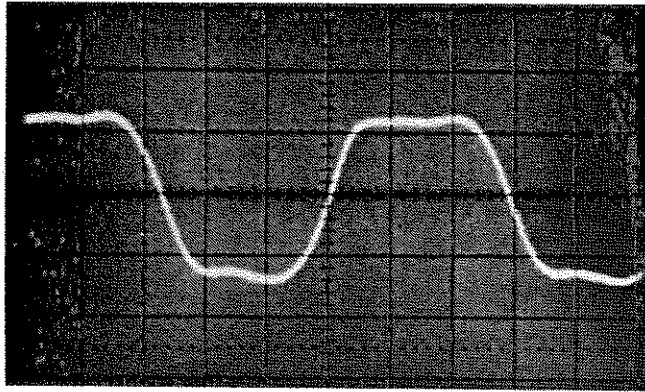


Fig. 3-43 Waveform at Z2 Test Point ⑥

H: 0.5 ns/div
V: 0.5 V/div



(f) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑥. If the waveform is as shown in Fig. 3-43, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q9 and Q16, and the peripheral circuits.

The above table lists the standard values. The tolerance range is $\pm 10\%$.

| Dc Voltage | +1.5 V | +2.0 V | -2.0 V |
|------------|--------|--------|--------|
| | ③ | ④ | ⑤ |

Table 3-15 Dc Voltages at Z2 Test Points ③, ④, and ⑤

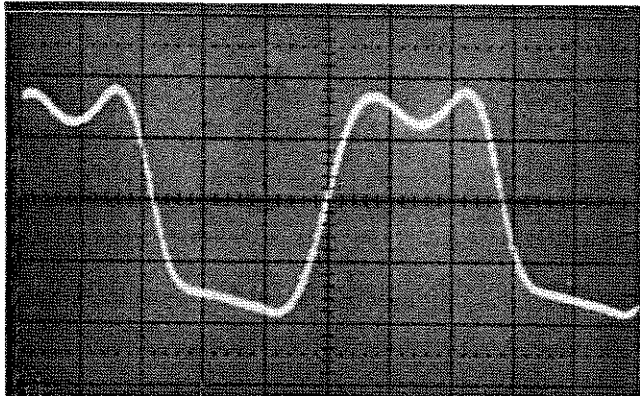
(e) Use a dc voltmeter to measure the dc voltages at Z2 test points ③ to ⑤. If the voltages are as listed in Table 3-15, go to the next step. If the voltages are abnormal, troubleshoot the circuits for Q4 and Q31, and the peripheral circuits.

The dc biases of the Q17 to Q21 gates should also change in the same way as the Q22 gate when PHASE ADJUST is set from -5 to -1.

(h) Use a dc voltmeter to measure the dc voltage at Z2 test point ⑧ and check that the dc bias of the Q22 gate changes to High or Low as listed in Table 3-16 when PHASE ADJUST is set to 0 and except to 0.

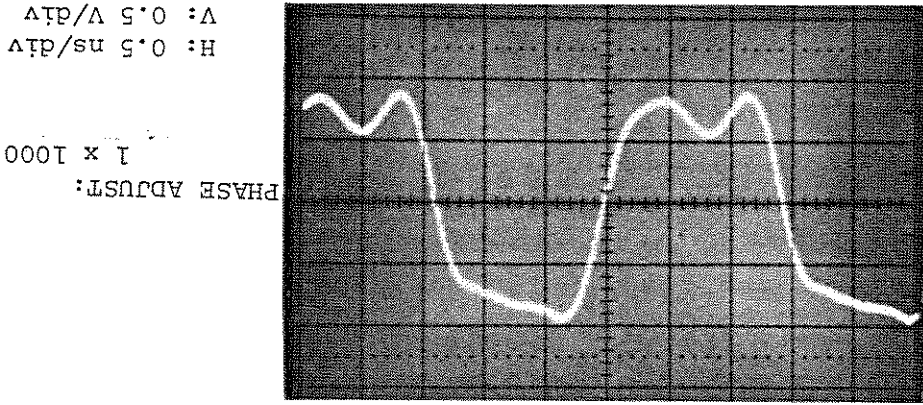
Fig. 3-44 Waveform at Z2 Test Point ⑦

H: 0.5 ns/div
V: 0.5 V/div



(g) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑦. If the waveform is as shown in Fig. 3-44, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q22 and Q34, and the peripheral circuit. See Item (h) for details of troubleshooting Q34. Also, check that the waveform appears at Z3 test point ⑦ (even when the PHASE ADJUST setting is changed from -5 to 0.)

Fig. 3-45 Waveform at Z2 Test Point ⑨



Note that a waveform will only appear at ⑨ when PHASE ADJUST is set from 1 to 5. The operation is similar to that described in items in (g) and (h). Therefore, it is necessary to check the dc bias changes in the Q24 to Q28 gates.

(i) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z2 test point ⑨. If the waveform is as shown in Fig. 3-45, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q24 to Q28, Q35, and Q36, and the peripheral circuits after performing the troubleshooting described in item (j).

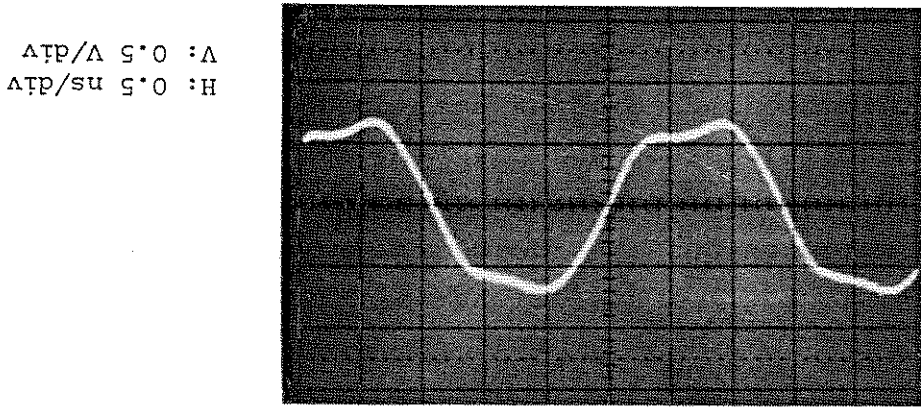
| | |
|------------------------|-----------------|
| PHASE ADJUST: 0 | DC Voltage at ⑧ |
| PHASE ADJUST: except 0 | -0.4 to -0.7 V |
| | -1.6 to 2.0 V |

Table 3-16 DC Voltages at Z2 Test Point ⑧

If the waveform is as shown in Fig. 3-47, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q12 and Q34, and the peripheral circuits after performing the troubleshooting described in items (g) and (j).

(k) Use the sampling oscilloscope to check the waveform at Z2 test point ⑩.

Fig. 3-46 Waveform at Z2 Test Point ⑩



(j) Use the sampling oscilloscope with probe to check the waveform at Z2 test point ⑩. If the waveform is as shown in Fig. 3-46, go to the next step. If the waveform is abnormal, troubleshoot the circuits for Q9 and Q23, and the peripheral circuit.

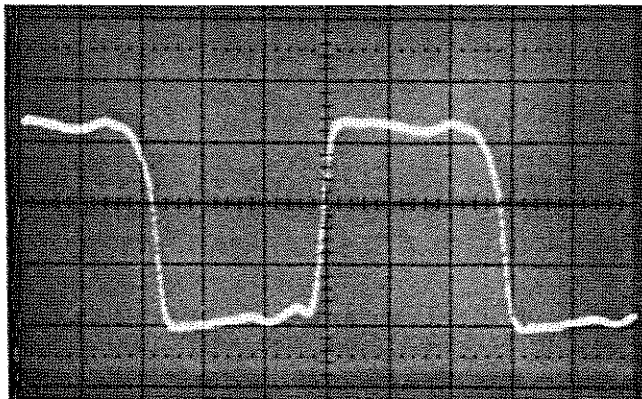
| | | | |
|---------------------------------|---------------------------------|------------------|----------------|
| No clock signal | +0.6 to +0.8 V | +1.0 V to +1.2 V | -1.8 to -2.1 V |
| Clock signal | +0.6 to +0.8 V | +0.5 to +0.7 V | -0.4 to -0.7 V |
| Voltage at Q36 pins 4 and 10 | Voltage at Q36 pins 5 and 11 | | ⑩ |

Table 3-17 DC Voltages at Z2 Test Point ⑩

- (1) Use a dc voltmeter to measure the dc voltage at Z2 test point ⑩ and check that it is as listed in Table 3-17.
- If the voltage is abnormal, troubleshoot the circuits for Q4, Q5, and Q36, and the peripheral circuits. The voltages at pins 5 and 11 of Q36 and change at listed in Table 3-13 when CLOCK signal input to the J2 of PC board Z2 is set to ON and OFF.

Fig. 3-47 Waveform at Z2 Test Point ⑪

H: 0.5 ns/div
V: 0.5 V/div



(m) Use a dc voltmeter to measure the dc voltages at Z2 test points ⑬ to ⑮ .

Table 3-18 lists the normal values.

If the voltages are abnormal, troubleshoot the circuits from Q37 to Q40, and the peripheral circuits.

Table 3-18 DC Voltages at Z2 Test Points ⑬ , ⑭ , and ⑮

| PHASE ADJUST Setting | | | | | | | | | | | | |
|----------------------|----|----|----|----|----|---|---|---|---|---|---|---|
| | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | |
| Q37 pin 23 | T | H | T | H | T | H | T | H | T | H | T | ⑬ |
| Q37 pin 22 | T | T | H | H | T | H | T | H | T | H | T | H |
| Q37 pin 21 | T | T | T | T | T | T | T | T | T | T | T | H |
| Q37 pin 20 | T | T | T | T | T | T | T | T | T | T | T | H |
| Q37 pin 1 | T | H | T | H | T | H | T | H | T | H | T | H |
| Q37 pin 2 | H | T | H | H | H | H | H | H | H | H | H | H |
| Q37 pin 3 | H | H | T | H | H | H | H | H | H | H | H | H |
| Q37 pin 4 | H | H | H | H | T | H | H | H | H | H | H | H |
| Q37 pin 5 | H | H | H | H | H | T | H | H | H | H | H | H |
| Q37 pin 6 | H | H | H | H | H | H | T | H | H | H | H | H |
| Q37 pin 7 | H | H | H | H | H | H | H | T | H | H | H | H |
| Q37 pin 8 | H | H | H | H | H | H | H | H | T | H | H | H |
| Q37 pin 9 | H | H | H | H | H | H | H | H | T | H | H | H |
| Q37 pin 10 | H | H | H | H | H | H | H | H | H | T | H | H |
| Q37 pin 11 | H | H | H | H | H | H | H | H | H | H | T | H |
| Q40 pin 6 | T | T | T | T | T | T | T | T | T | T | T | ⑭ |
| Q40 pin 8 | H | H | H | H | H | H | H | H | H | H | H | ⑮ |

Notes:

H is +5 V \pm 0.5 V or less
 L is +0.4 V or less

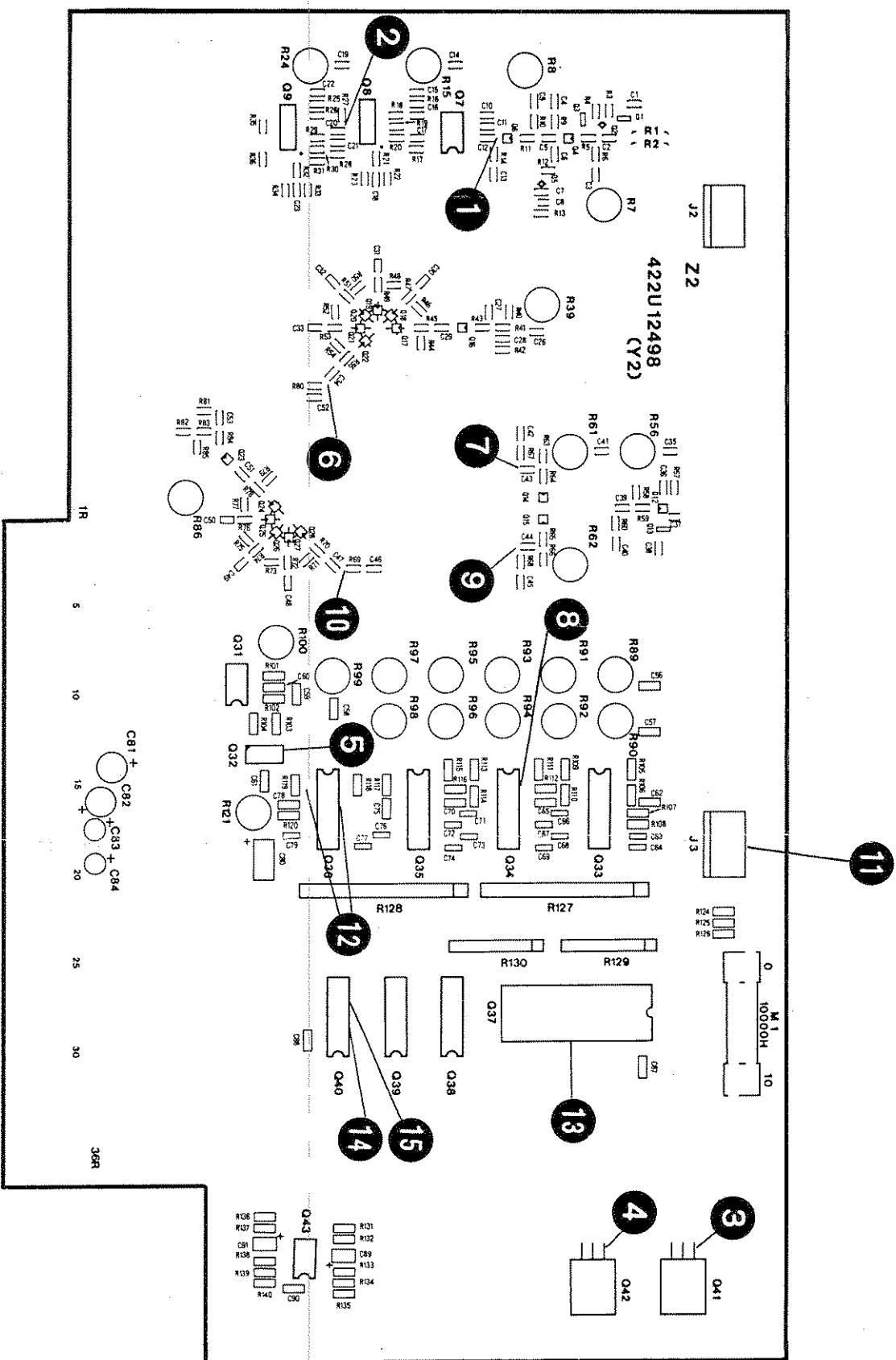


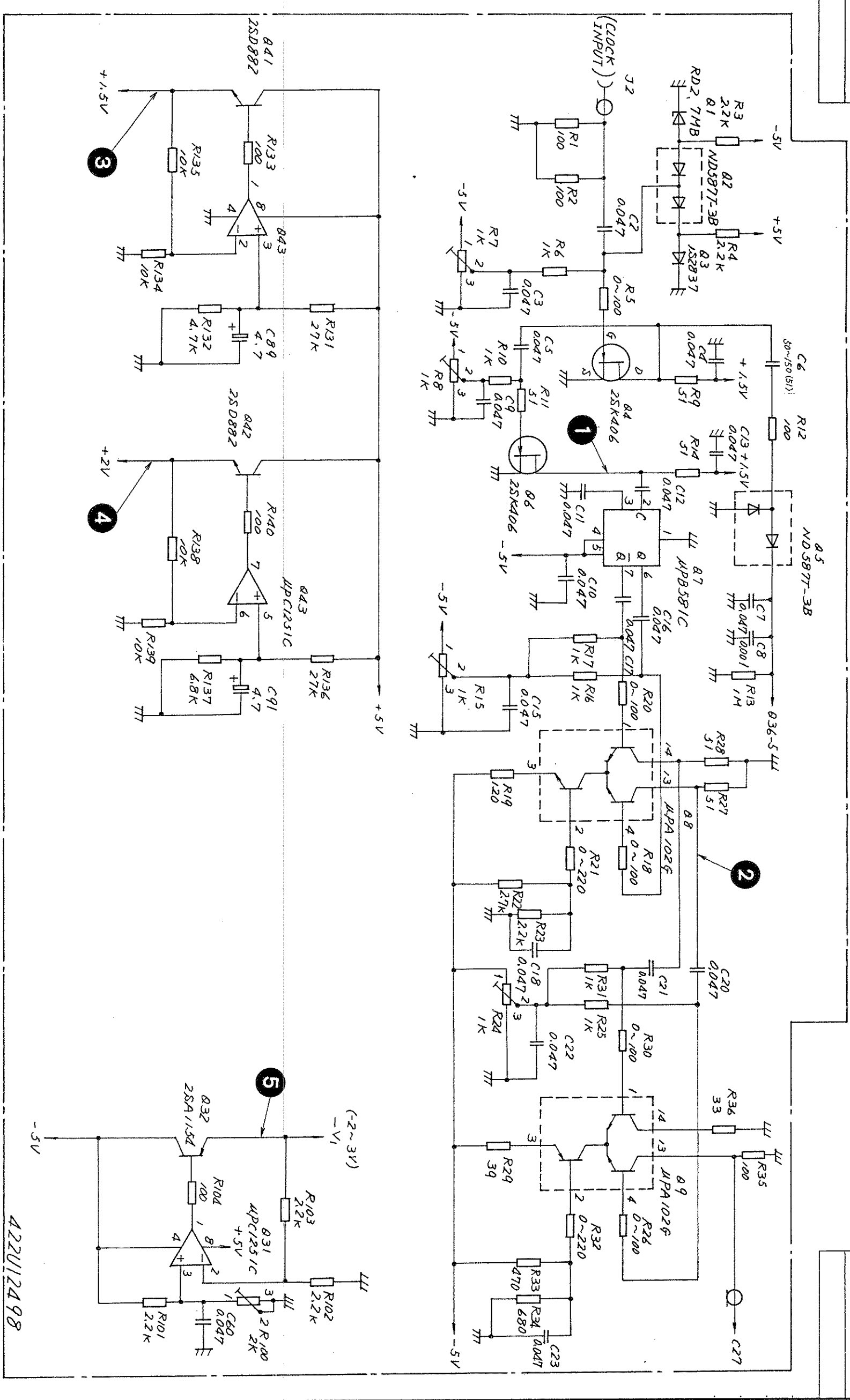
Fig. 3-48

Parts Layout of MH677A Z2
 Clock Delay PC Board **14**

3-145/(3-146 blank)

APPLICATION

REVISIONS



DEP

No. 0023-1985-08
43W33619 1/5

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|

Parts List 44WB3358

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|--------------------------------|----------|-----------------------------|----------|--------|
| | | TRACED BY | | |
| | | CHECKED BY | | |
| | | APPROVED BY | | |
| | | DRAWN BY <i>Miyakehachi</i> | | |
| TITLE | | SCALE | | |
| Z2 CLOCK DELAY Circuit Diagram | | | | |
| DRAWING No. 43W33619 | | | | |
| 3-147/3-148 | | | | |

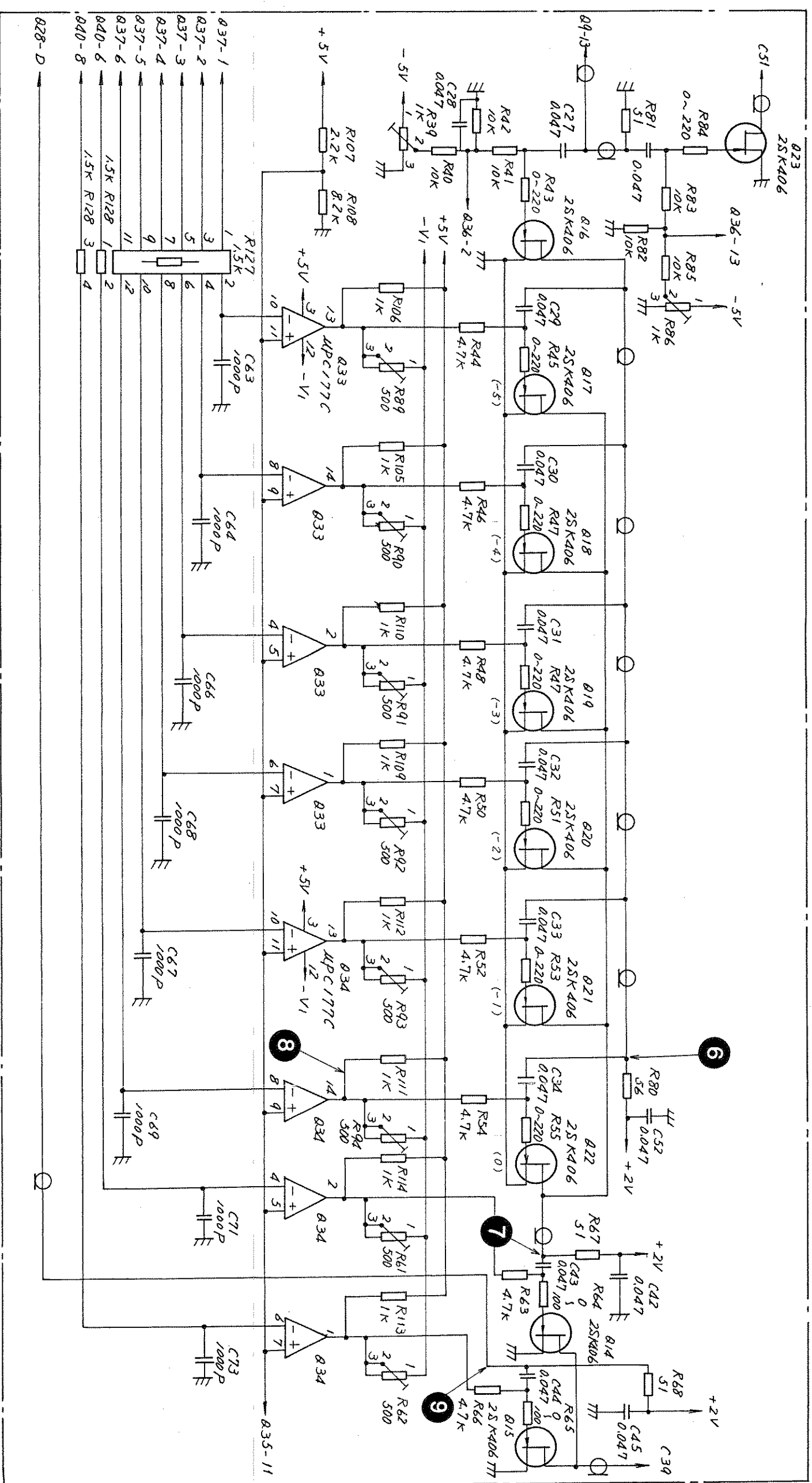
14

ANRITSU CORP.

3-147/3-148

APPLICATION

REVISIONS



DEP

No. D023-1985-08

43W33619 2/5

2

3

4

5

6

7

8

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------|----------|-------------|----------|--------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

TITLE

Z2 CLOCK DELAY Circuit Diagram

CHECKED BY

APPROVED BY

TRACED BY

DRAWN BY

SCALE

DRAWING No.

14

3-149/3-150

ANRITSU CORP.

3-149/3-150

ANRITSU CORP.

3-149/3-150

ANRITSU CORP.

3-149/3-150

ANRITSU CORP.

3-149/3-150

ANRITSU CORP.

3-149/3-150

ANRITSU CORP.

3-149/3-150

ANRITSU CORP.

3-149/3-150

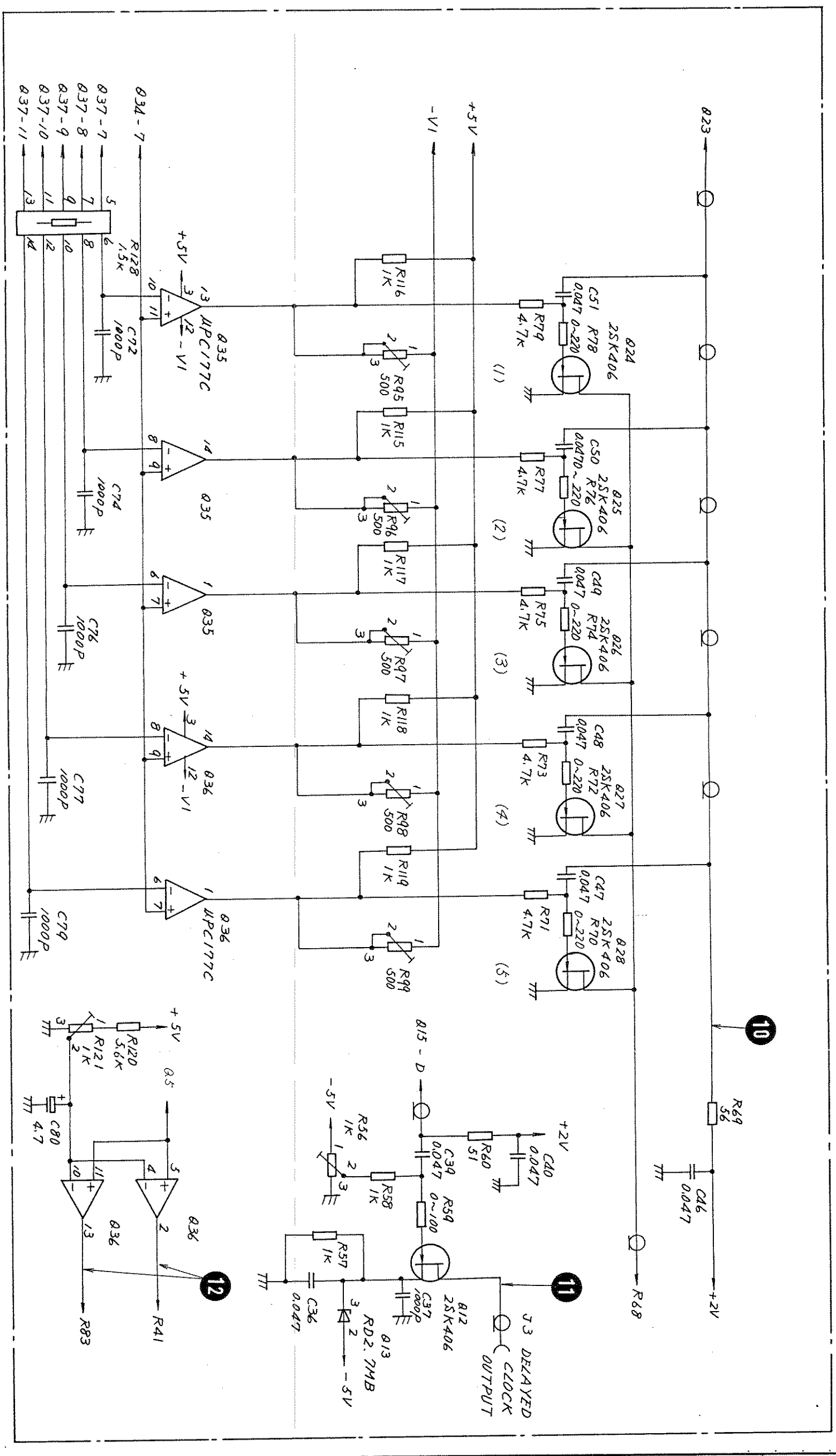
ANRITSU CORP.

3-149/3-150

ANRITSU CORP.

3-149/3-150

ANRITSU CORP.



DEP

| | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|
| No. D023-1985-08 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43W33619 3/5 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |

| | | | | |
|--------------------------------|----------|-------------|----------|--------|
| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| CHECKED BY | | | | |
| TRACED BY | | | | |
| APPROVED BY | | | | |
| DRAWN BY <i>Magnus</i> | | | | |
| SCALE | | | | |
| TITLE | | | | |
| Z2 CLOCK DELAY Circuit Diagram | | | | |
| DRAWING No. 43W33619 3/5 | | | | |

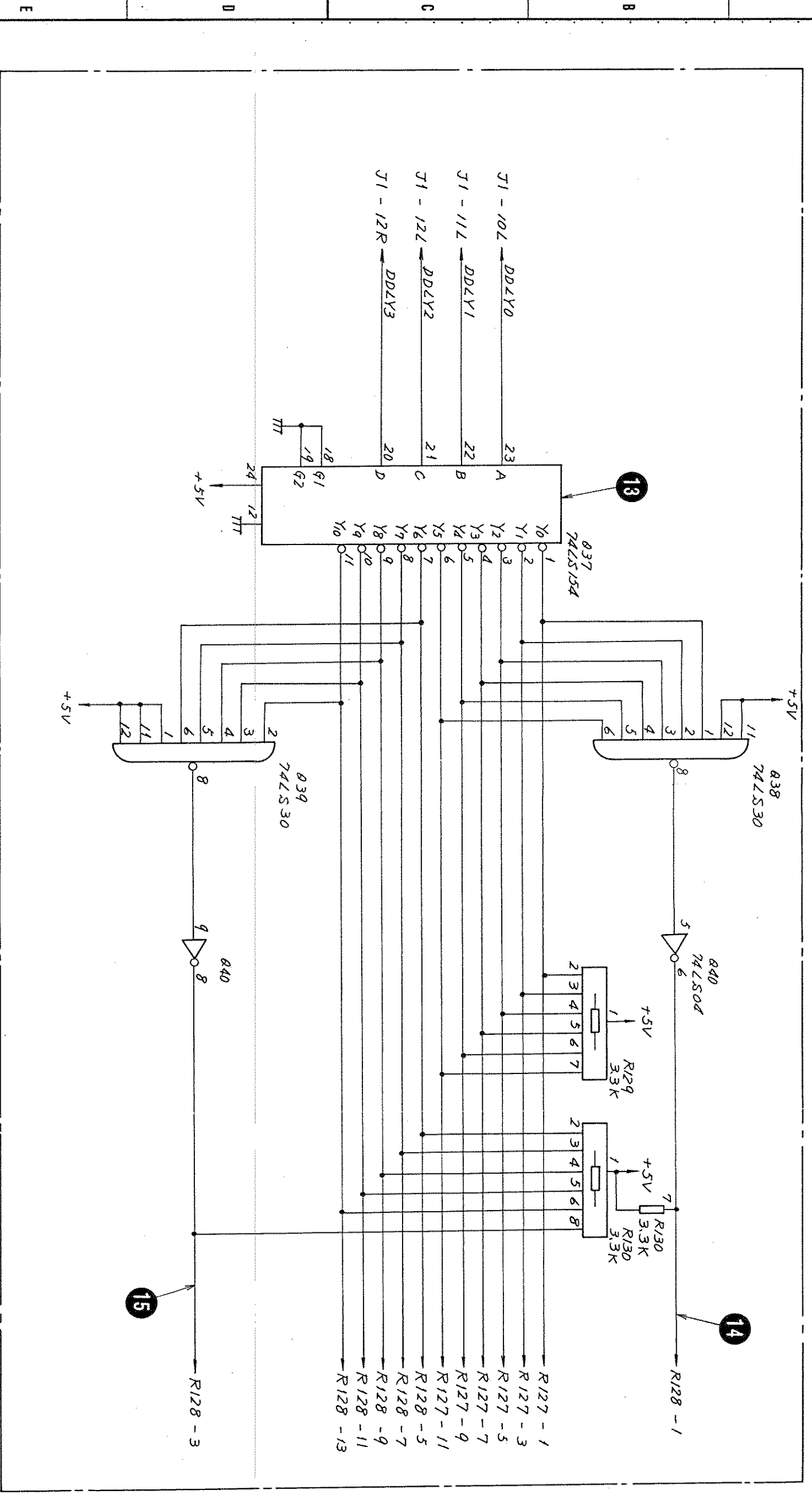
14

ANRITSU CORP.

3-151/3-152

APPLICATION

REVISIONS



| |
|-----|
| DEP |
|-----|

| | | | | | | | | |
|------------------|---|---|---|---|---|---|---|---|
| No. 0023-1985.08 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43W33619/5 | | | | | | | | |

| | | | | |
|--------------------------------|-----------------------------|-------------|---------------------------|--------|
| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
| Z2 CLOCK DELAY Circuit Diagram | | | | |
| CHECKED BY | DRAWN BY <i>M. K. S. K.</i> | | SCALE | |
| APPROVED BY | | | | |
| DRAWING No. 43W33619/5 | | | ANRITSU CORP. 3-153/3-154 | |

14

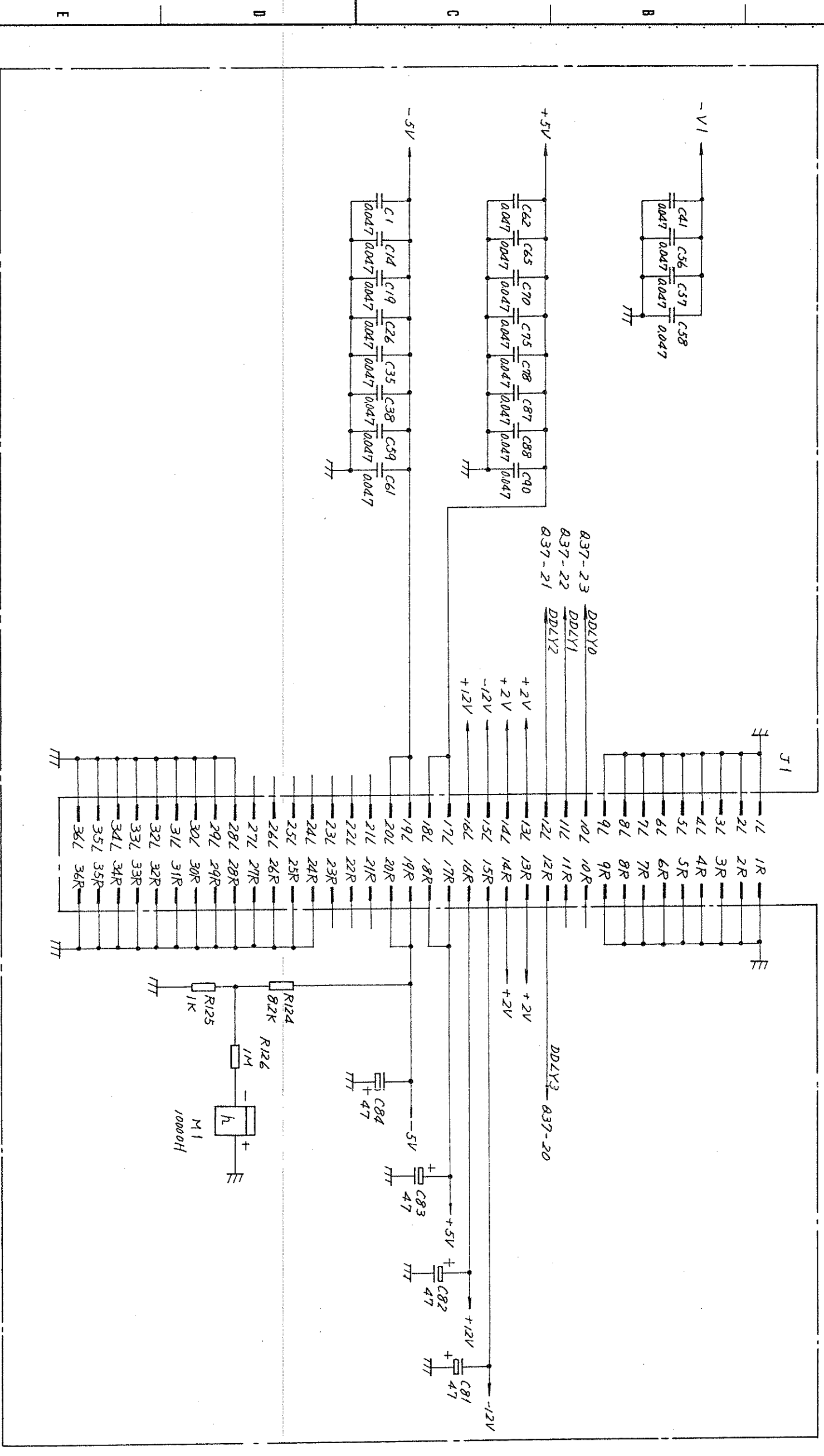
15

13

14

APPLICATION

REVISIONS



DEP

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------|----------|-------------|----------|--------|
| | | | | |
| | | | | |

14

CHECKED BY
 APPROVED BY
 TRACED BY
 DRAWN BY *Miyabuchi*
 SCALE

TITLE
 X22 CLOCK DELAY Circuit Diagram
 DRAWING No. 43W33619

No. 0023-1985-08

43W33619 5/5

2

3

4

5

6

7

8

ANRITSU CORP.

3-155/3-156

(1) Circuit description

Figure 3-49 shows the Z1 demultiplexer circuit

block diagram.

A data input signal is input to the pulse shape through the threshold circuit.

Even when the input DATA has a dc offset, the

threshold circuit eliminates it if DATA THRESHOLD is

set on the panel. The pulse stretcher widens the pulse when the RZ format is used. After passing through the

pulse stretcher, the DATA is branched into two

signals, input to the D-type flip-flops. The flip-

flops retime the DATA using two shaped output signals

(one is a polarity-reversed signal) from the delayed

clock, and then send them to the DATA1 and DATA2

output circuits. The DATA is output from the DATA1 or

DATA2 circuit (whichever selected by the relay).

The CLOCK signal is also output through an output

circuit.

The DATA1/DATA2 and CLOCK output signals from the

MH677A are sent to the DATA INPUT and CLOCK INPUT

terminals of the ME522A receiver.

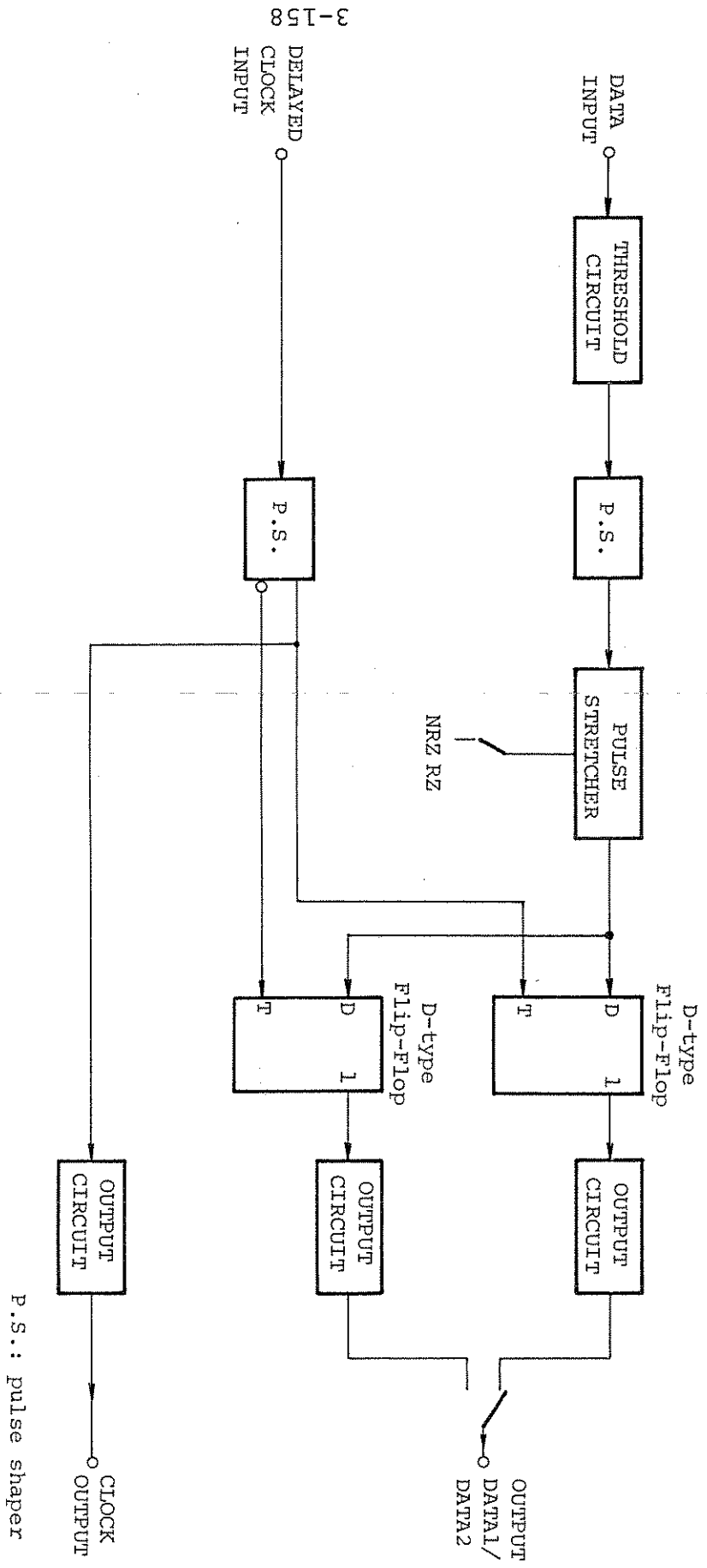


Fig. 3-49 MH677A Z1 DEMUX Block Diagram

P.S.: pulse shaper

(2) Troubleshooting

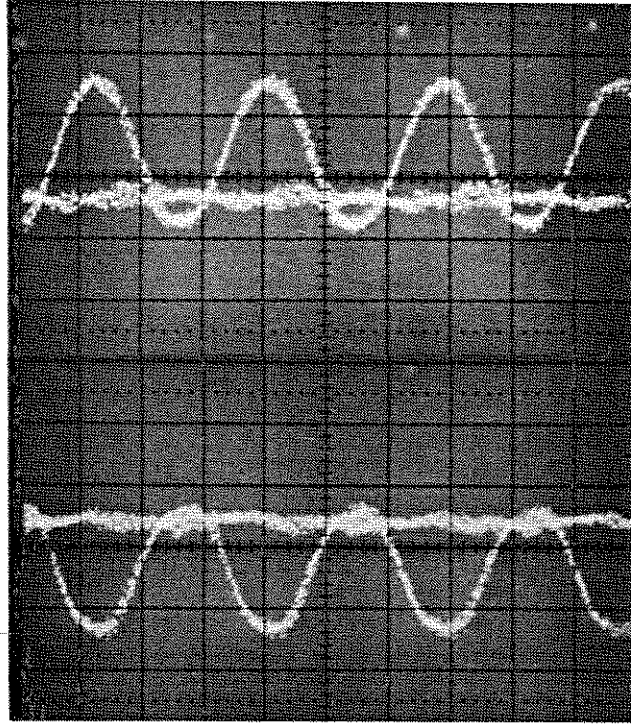
- (a) Remove the PC board Z1, and insert the extender board where the Z1 PC board was located. Then connect Z1 to the extender board. Set PC board Z1 to the same state as described in 3.6.4 (2) (a) and connect J3 of Z2 and J6 of Z1 with a cable. Disconnect the connectors from J2, J4, and J5 of PC board Z1, and connect J2 of PC board Z1 and the DATA OUTPUT terminal of the MH676A. (Use the SMA-P.RG58A/U:SMA-P 1 m coaxial cable as described in 3.6.4 (2) (a).)
- (b) Set the MS522A Transmitter, MH676A, and MH677A in the same way as described in 3.6.4 (2) (b).
- (c) Use the sampling oscilloscope with probe (MP671A) to check the waveforms at Z1 test points ① and ②.
- If the voltages are as shown in Figs. 3-50 and 3-51, go to the next step.
- If the voltages are abnormal, perform the operation described in item (d) and troubleshoot the circuits for J2, Q6, Q7, and the peripheral circuits. Check the waveforms by setting DATA FORMAT of the MH676A to NRZ or RZ.

3-160

In RZ Format

Fig. 3-51 Waveform at Z1 Test Point ① and ②

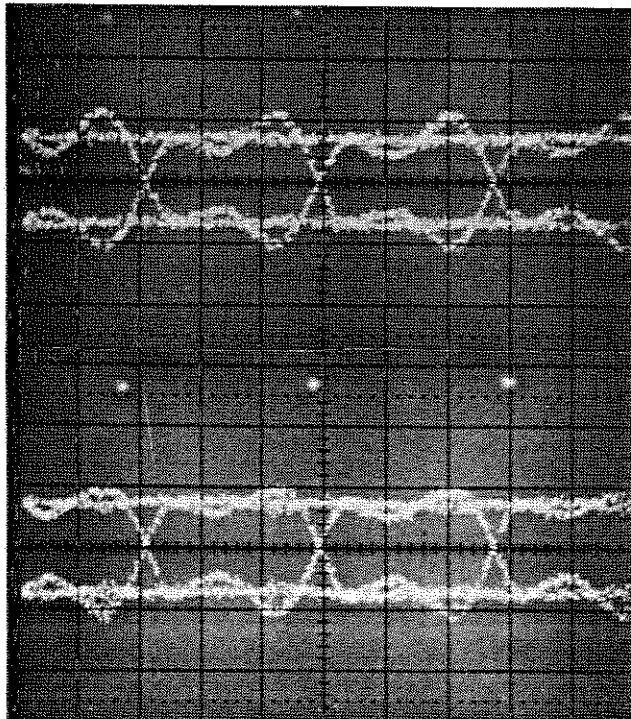
H: 0.5 ns/div
V: 0.5 V/div



In NRZ Format

Fig. 3-50 Waveform at Z1 Test Point ① and ②

H: 0.5 ns/div
V: 0.5 V/div



NRA or RZ.

The DATA FORMAT of the MH676A should be set to

Q14, and the peripheral circuits.

abnormal, troubleshoot the circuits from Q11 to 3-53, go to the next step. If the waveforms are If the waveforms are as shown in Figs. 3-52 and

④

to check the waveforms at Z1 test point ③ and

(e) use the sampling oscilloscope with probe (MP671A)

The tolerance range is $\pm 10\%$

The above table lists the standard value.

| MH676A setting | | MH677A | | THRESHOLD | | OFFSET | | AMPLITUDE | | | |
|----------------|------|--------|---------|-----------|--------|--------|------|-----------|--------|--------|--------|
| 3 V | -1 V | -2.5 V | +0.6 V | -5.2 V | 0.45 V | 1 V | +4 V | +3.5 V | +2.9 V | 130 mV | +45 mV |
| 1 V | 0 V | -0.5 V | +1.35 V | -3.5 V | +80 mV | 1 V | | | | | |

⑤

⑥

⑦

⑧ , ⑨ , and ⑩

Table 3-19 DC Voltages at Z1 Test Points

MH676A and MH677A as described in 3.6.4 (2)(b).

After checking, go to step (e) after setting the

MH677A (as listed in Table 3-19).

MH676A and the DATA THRESHOLD setting of the

OUTPUT AMPLITUDE and OFFSET settings of the

Also measure the voltages when changing the DATA

circuits.

circuits for Q19 and Q18, and the peripheral

If the voltages are abnormal, troubleshoot the

Table 3-19 lists the normal voltages.

Z1 test points ⑪ to ⑫

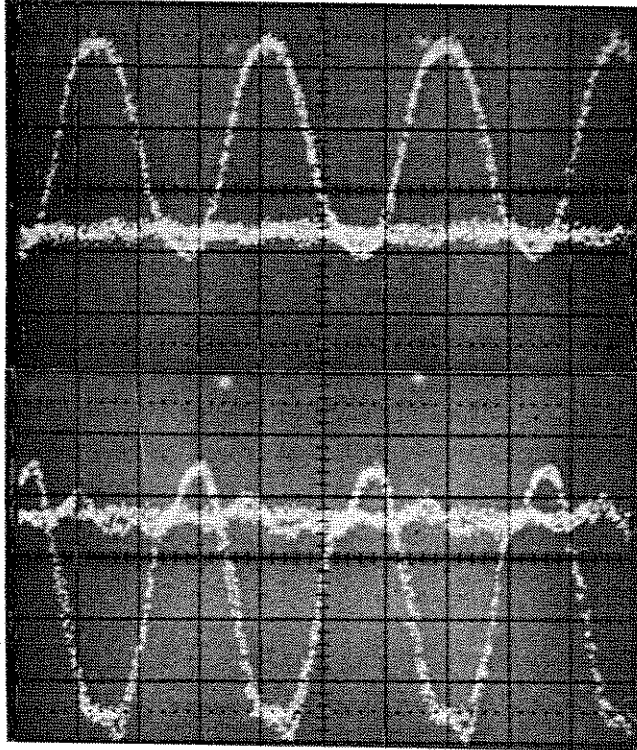
(d) use a dc voltmeter to measure the dc voltages at

3-162

in RZ Format

Fig. 3-53 Waveform at Z1 Test Point ③ and ④

H: 0.5 ns/div
V: 0.5 V/div



in NRZ Format

Fig. 3-52 Waveform at Z1 Test Point ③ and ④

H: 0.5 ns/div
V: 0.5 V/div

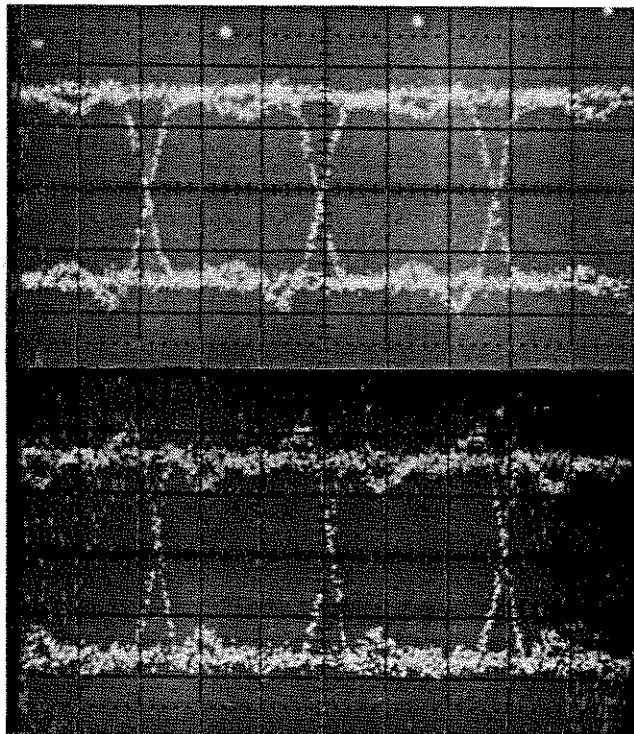


Fig. 3-55 Waveform at Z1 Test Point
 in RZ Format ⑤

H: 0.5 ns/div
 V: 0.5 V/div

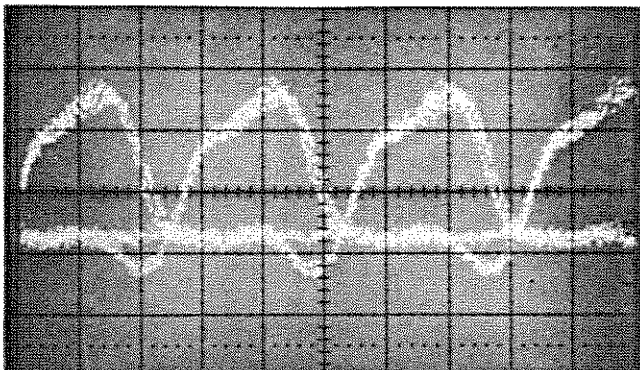
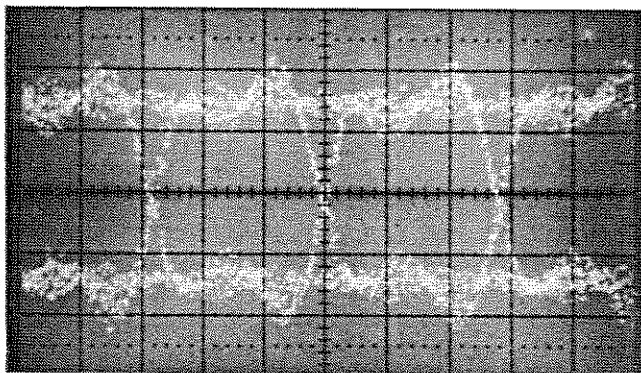


Fig. 3-54 Waveform at Z1 Test Point
 in NRZ Format ⑤

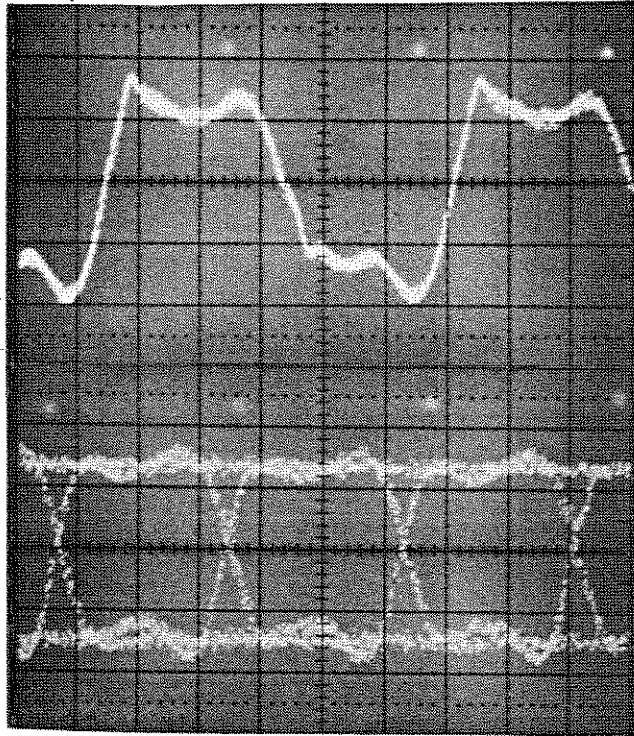
H: 0.5 ns/div
 V: 0.5 V/div



(F) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point. ⑤
 If the waveform is as shown in Figs. 3-54 or 3-55, go to the next step.
 If the waveform is abnormal, troubleshoot the peripheral circuits.
 To check ⑤, set the MH676A and MH677A FORMATS to NRZ or RZ.

Fig. 3-56 Waveform, at Z1 Test Point ⑥ and ⑦ in NRZ Format

H: 0.5 ns/div
V: 0.5 V/div



(g) Use the sampling oscilloscope with probe (MP671A) to check the waveforms and phases at Z1 test points ⑥ and ⑦ .

Figure 3-56 and 3-57 shows the standard waveforms. To check ⑥ and ⑦ , set the MH676A and MH677A formats to NRZ or RZ.

If the waveforms are abnormal, troubleshoot the circuits for Q32, Q34, Q36, Q43, and Q44, and the peripheral circuits.

PHASE ADJUST should be set to 0.

PHASE ADJUST should be set to 0.

peripheral circuits.

circuits for Q33, Q34, and Q41, and the
If the waveforms are abnormal, troubleshoot the

to the next step to check ⑧ and ⑨ .

If they are as shown in Figs. 3-58 and 3-59, set
the MH676A and MH677A formats to NRZ or RZ and go

points ⑧ and ⑨ .

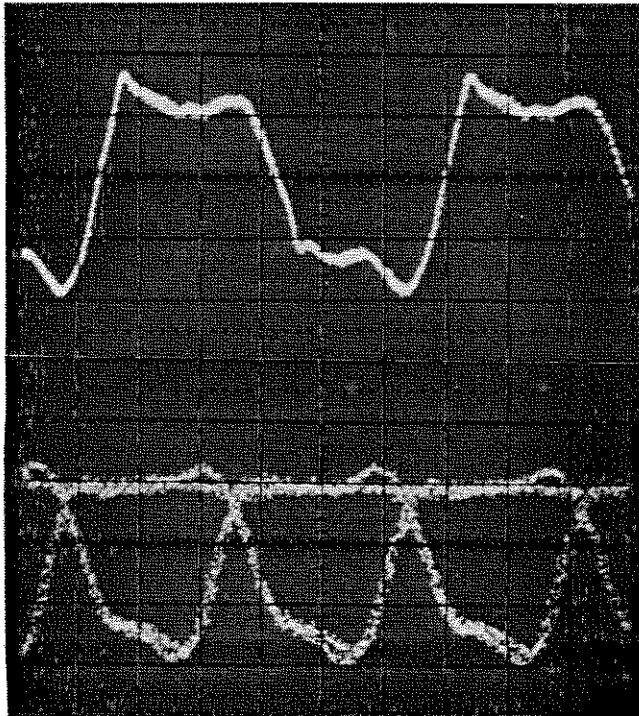
to check the waveforms and phases at Z1 test

(h) Use the sampling oscilloscope with probe (MP671A)

in RZ Format

Fig. 3-57 Waveform at Z1 Test Point ⑥ and ⑦

H: 0.5 ns/div
V: 0.5 V/div



⑦

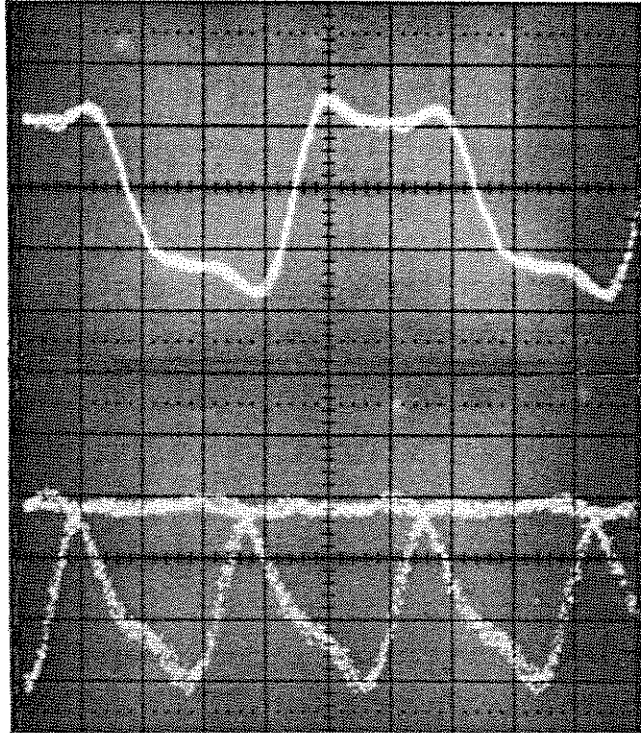
⑥

3-166

in RZ Format

Fig. 3-59 Waveform at Z1 Test Point ⑧ and ⑨

H: 0.5 ns/div
V: 0.5 V/div



in NRZ Format

Fig. 3-58 Waveform at Z1 Test Point ⑧ and ⑨

H: 0.5 ns/div
V: 0.5 V/div

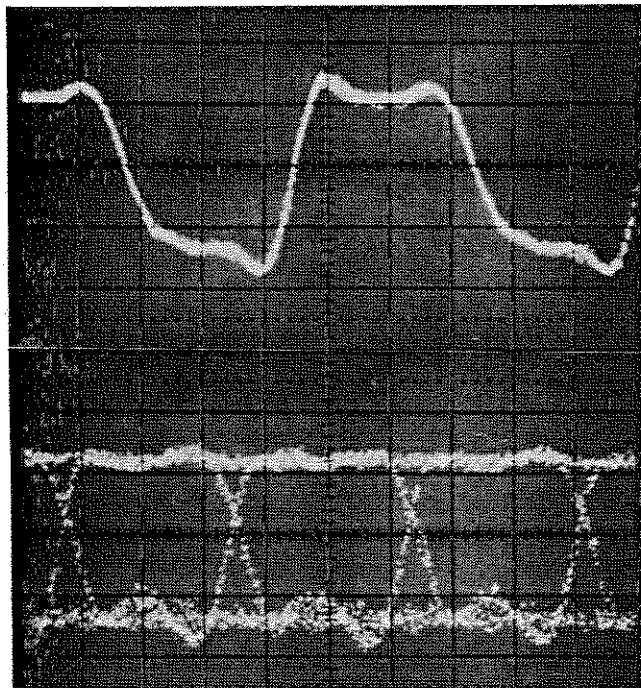
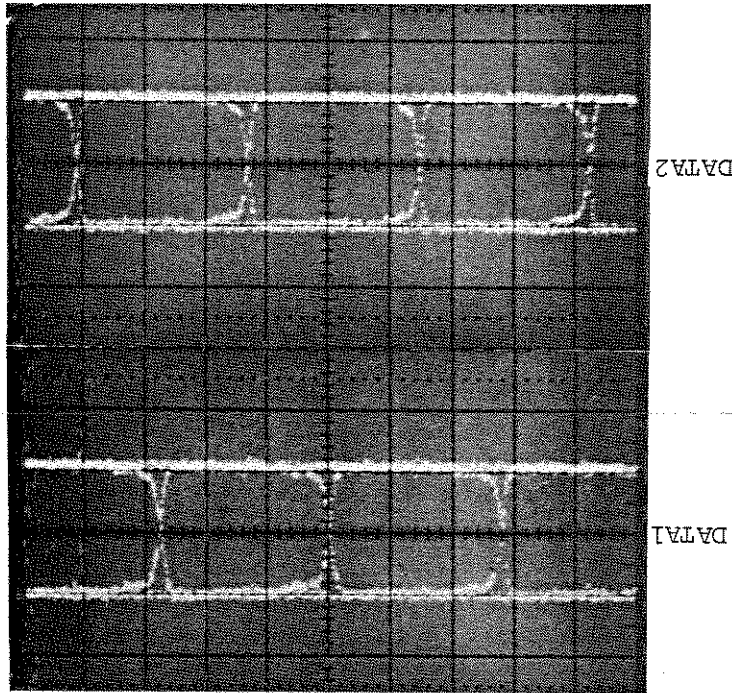


Fig. 3-60 Waveform at Z1 Test Point ⑩

H: 1 ns/div
V: 0.5 V/div



Set OUTPUT to DATA1 and then DATA2 to check the waveform at ⑩ .
 If the waveforms are abnormal, troubleshoot the circuits for Q31, Q28, Q30, and K3, and the peripheral circuits.

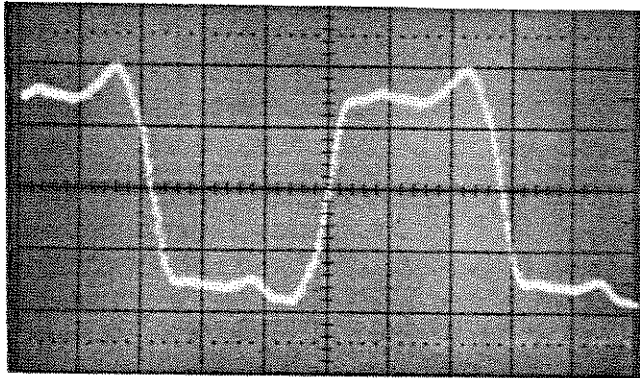
Make sure that the waveform does not change even when the MH676A and MH677A formats are set to NRZ or RZ.
 Figure 3-60 shows the standard waveform.

- (i) Use the sampling oscilloscope to check the waveform at Z1 test point ⑩ .

(k) Use the sampling oscilloscope to check the waveform at Z1 test point ⑩. Figure 3-62 shows the normal waveform. If the waveform is abnormal, troubleshoot the circuits for Q43, Q45, and Q47, and the peripheral circuits.

Fig. 3-61 Waveform at Z1 Test Point ⑪

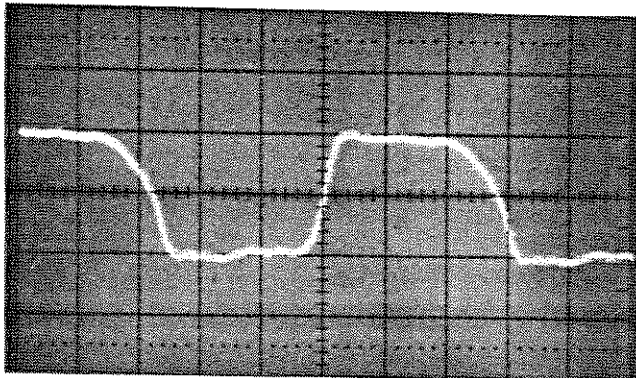
H: 0.5 ns/div
V: 0.5 V/div



(j) Use the sampling oscilloscope with probe (MP671A) to check the waveform at Z1 test point ⑪. If the waveform is as shown in Fig. 3-61, go to the next step. If the waveform is abnormal, troubleshoot the circuits for J6 and Q42, and the peripheral circuits.

Fig. 3-62 Waveform at Z1 Test Point ①

H: 0.5 ns/div
V: 0.5 V/div



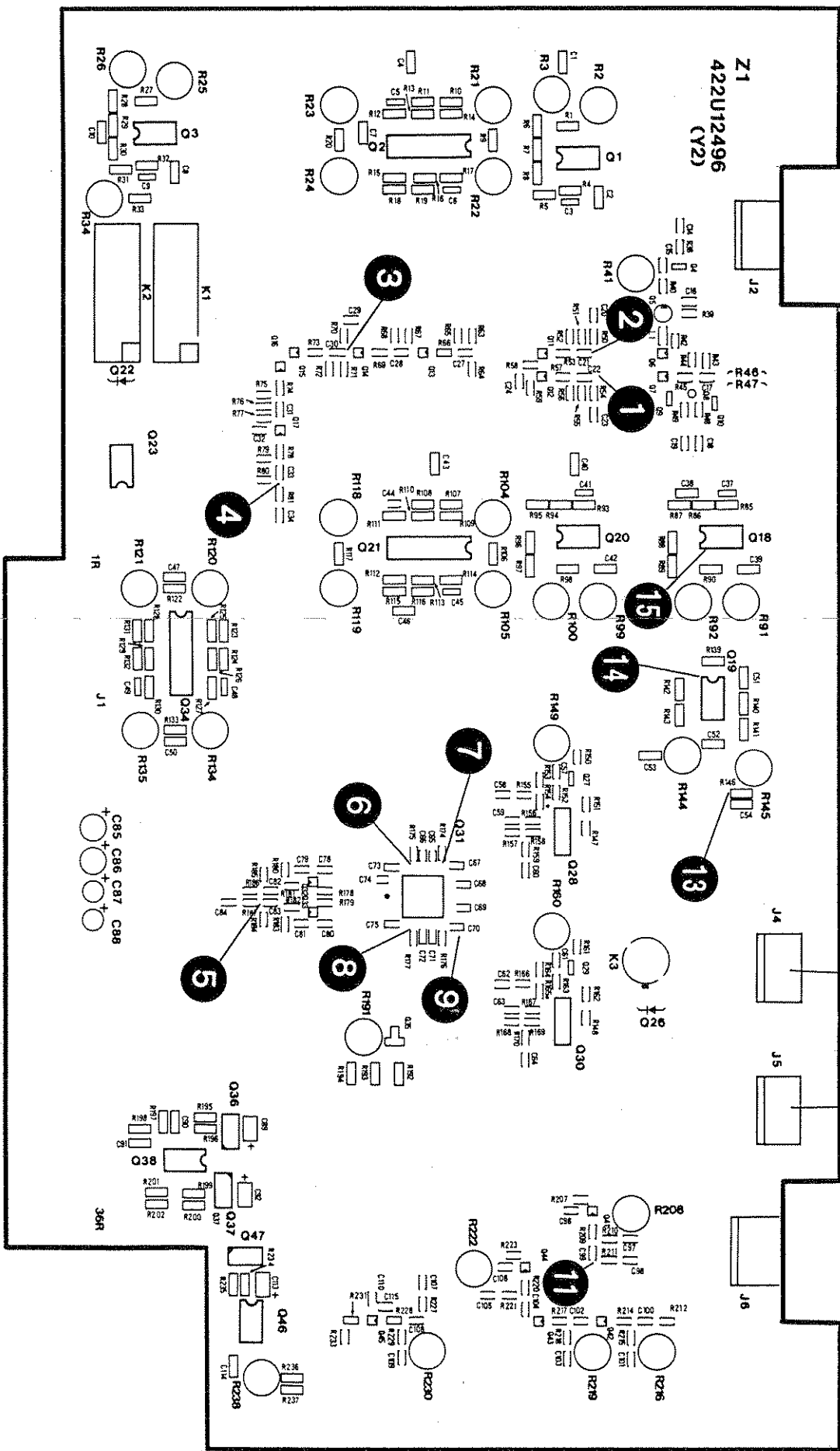
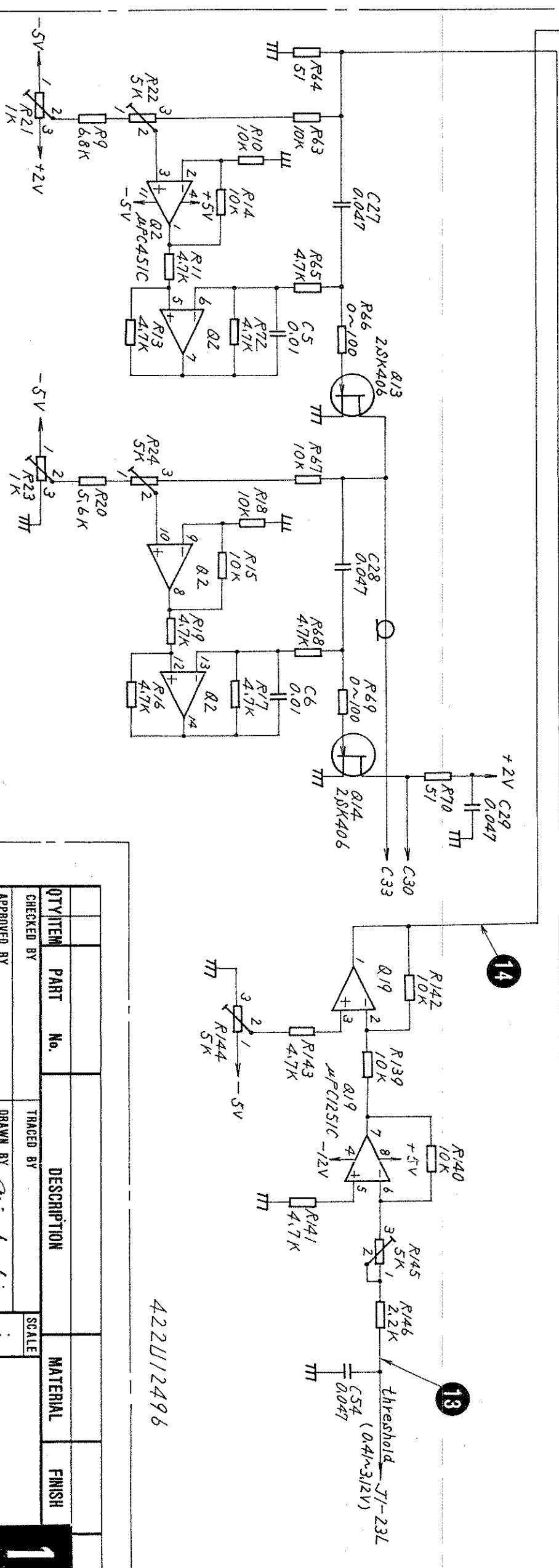
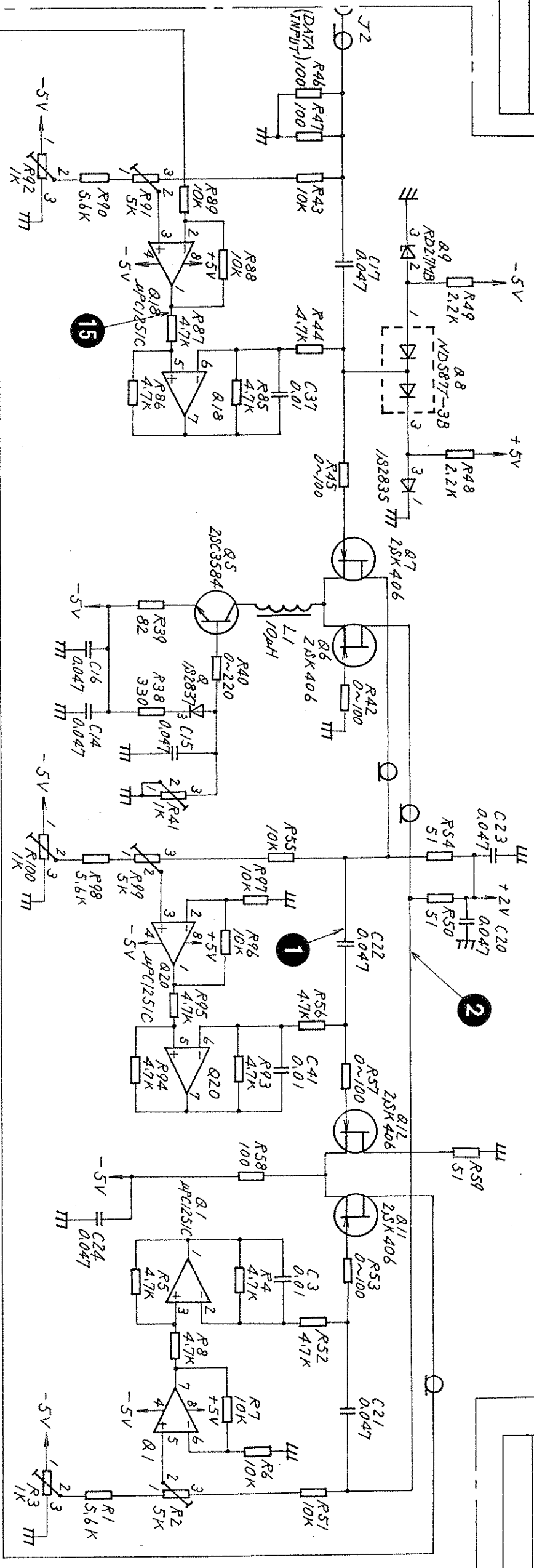


Fig. 3-63 Parts Layout of MH677A Z1 Demux PC Board

15

APPLICATION

REVISIONS



DEP

Parts List 44W83357

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----------------|-------------|--------------------------|---------------------------|----------|--------|
| | CHECKED BY | | TRACED BY | | |
| | APPROVED BY | | DRAWN BY <i>Magdalena</i> | | |
| TITLE | | Z1 DEMUX (demultiplexer) | | | |
| Circuit Diagram | | DRAWING No. 43W33618 | | | |

15

422U12496

No. 0023-1985-08

43W33618 1/5

2

3

4

5

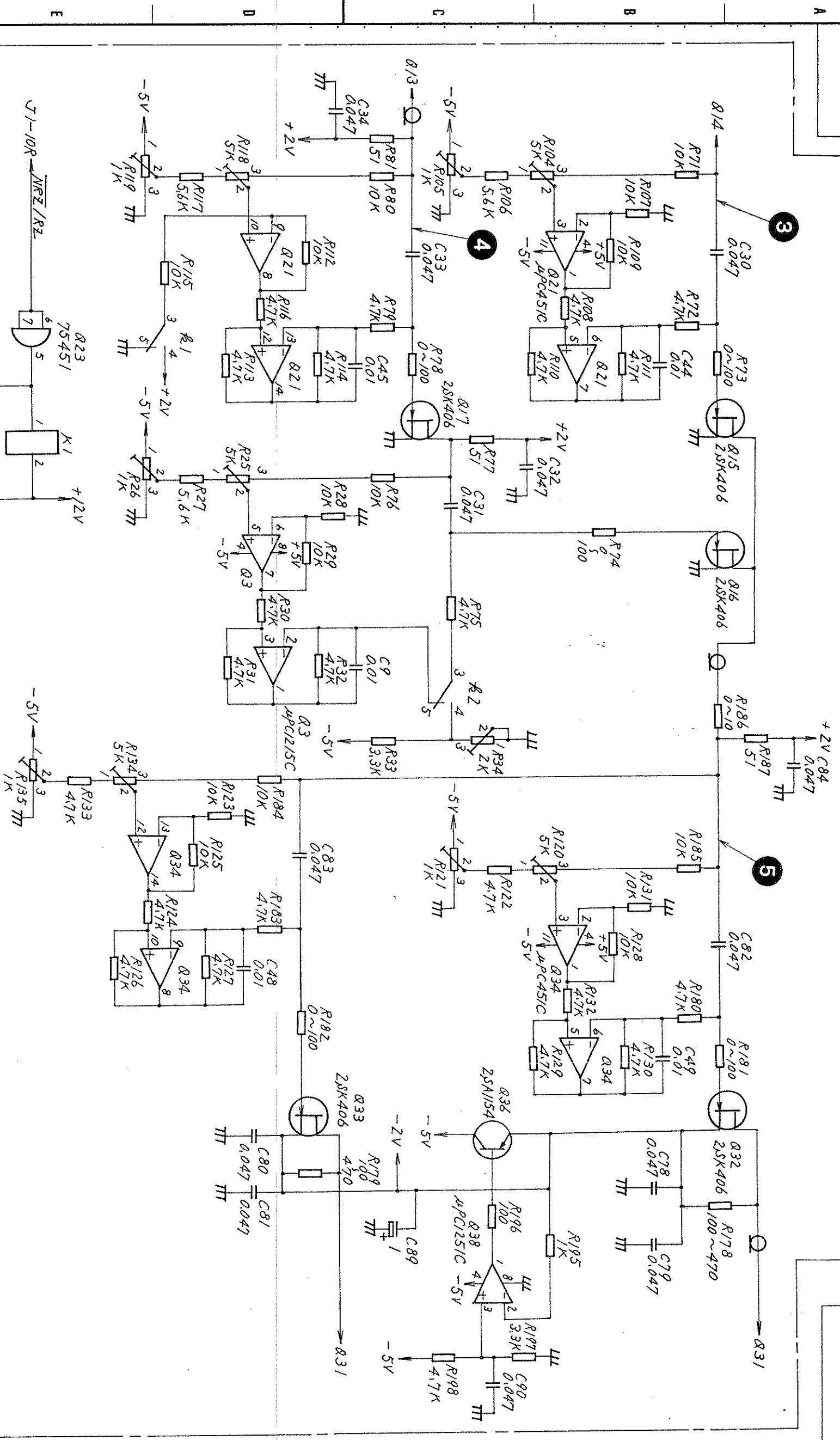
6

7

8

ANRITSU CORP.

3-171/3-172



DEP

No. D023-1985-08

43W 33618 2/5

2

3

4

5

6

7

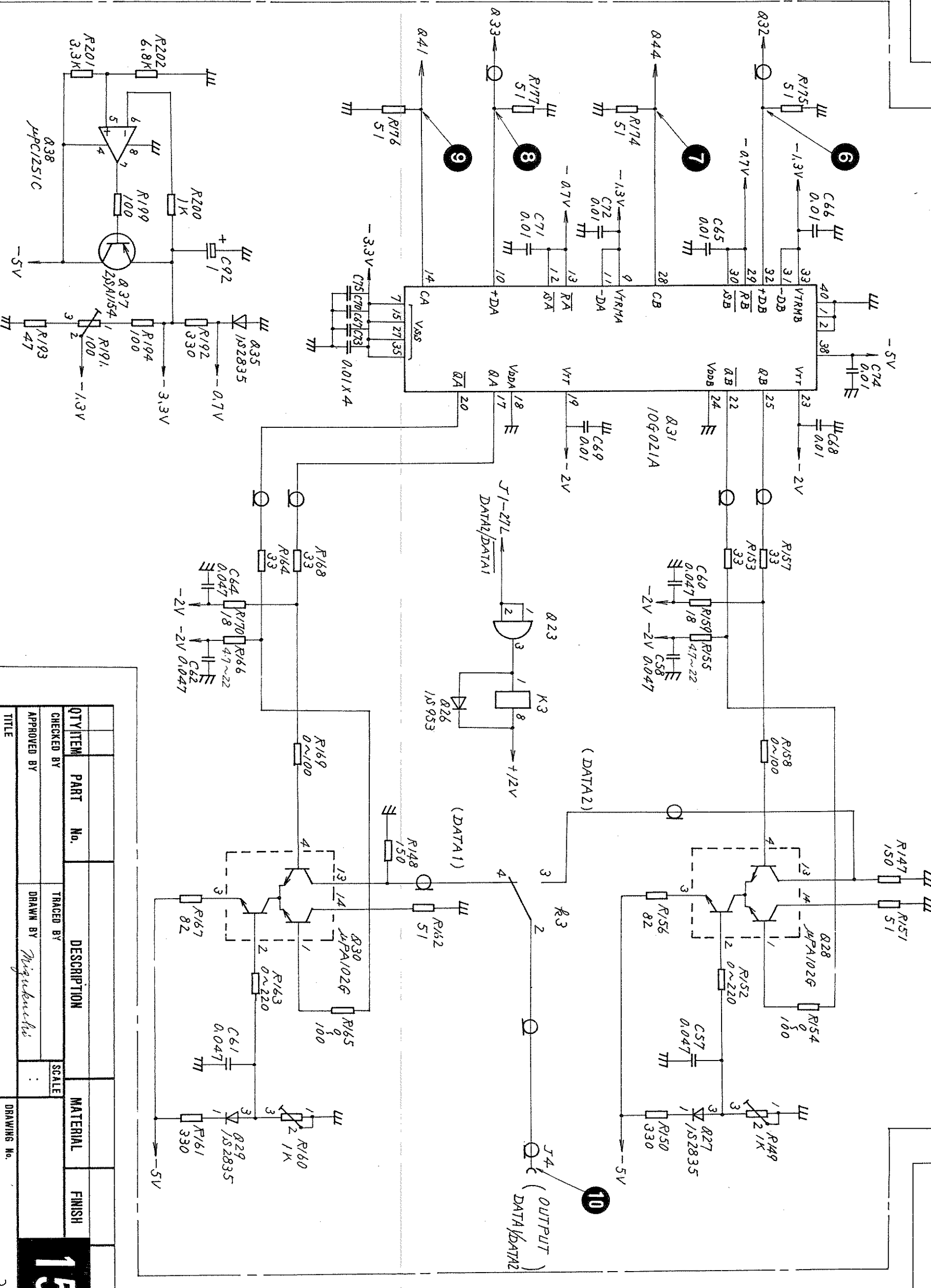
8

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|-------------|--------------------------|-------------|----------|--------|
| | CHECKED BY | | TRACED BY | | |
| | APPROVED BY | | DRAWN BY | | |
| | TITLE | Z1 DEMUX Circuit Diagram | | | |
| | DRAWING No. | 43W 33618 | | | |
| | SCALE | | | | |

15

ANRITSU CORP.

3-173/3-174



| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|--------------------------|------|----------|-------------|----------|--------|
| | | | | | |
| CHECKED BY | | | TRACED BY | SCALE | |
| APPROVED BY | | | DRAWN BY | | |
| TITLE | | | | | |
| Z1 DEMUX Circuit Diagram | | | | | |
| DRAWING No. | | | | | |
| 43W33618 3/5 | | | | | |
| 15 | | | | | |

DEP

No. 0023-1905.08

43W33618 3/5

2

3

4

5

6

7

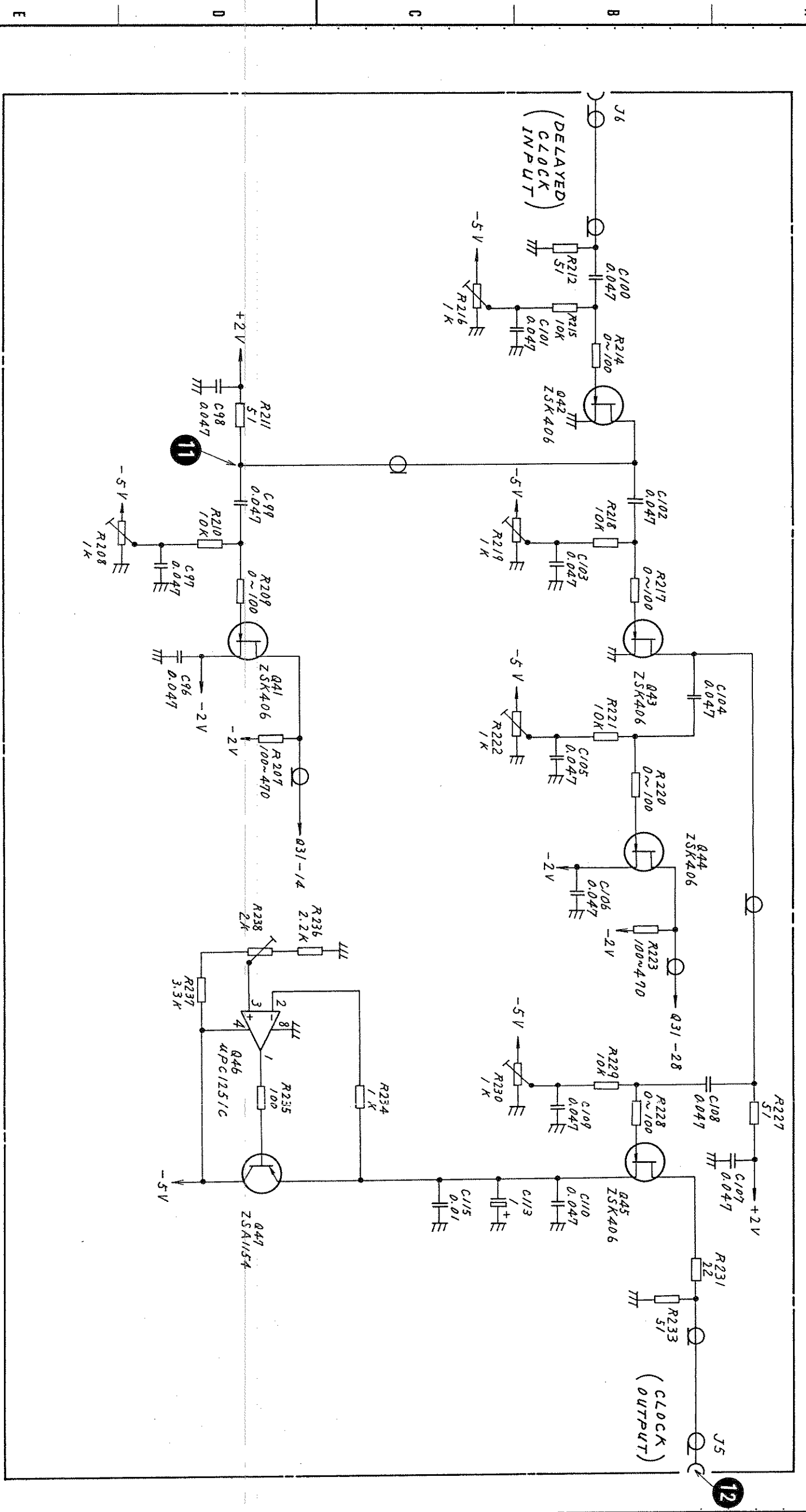
8

ANRITSU CORP.

3-175/3-176

APPLICATION

REVISIONS

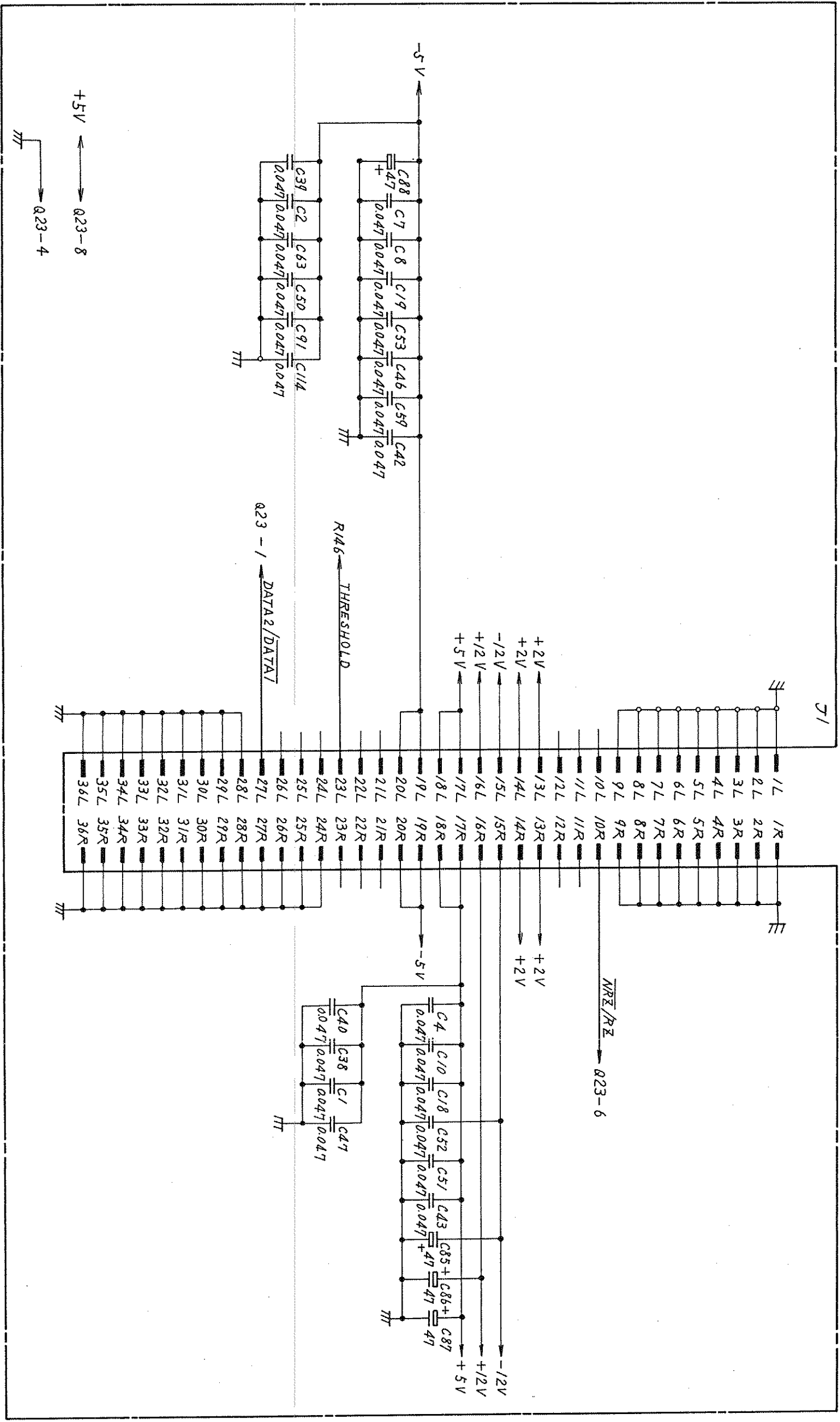


DEP

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------|----------|-------------|----------|--------|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |

| | | | |
|--------------------------|-----------|---------------|--|
| TITLE | | DRAWING No. | |
| Z1 DEMUX Circuit Diagram | | 43W 33618 4/5 | |
| CHECKED BY | TRACED BY | DRAWN BY | |
| | | Michael... | |
| APPROVED BY | SCALE | | |
| | | | |

15



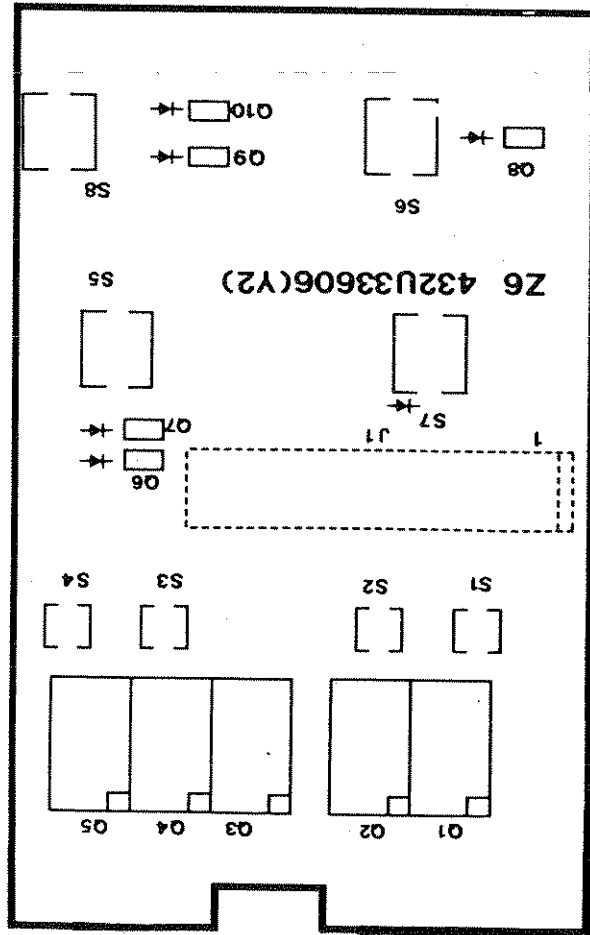
| | | | | | | | | |
|---------------------------------------|--|--|--|--------------------|--|----------------------|--|----|
| DEP | | | | | | | | |
| QTY/ITEM CHECKED BY APPROVED BY | | PART No. DESCRIPTION DRAWN BY <i>Miguel...</i> | | MATERIAL FINISH | | SCALE DRAWING No. | | 15 |
| TITLE Z1 DEMUX Circuit Diagram | | 43W33618 | | 5/5 | | 3-179/3-180 | | 15 |

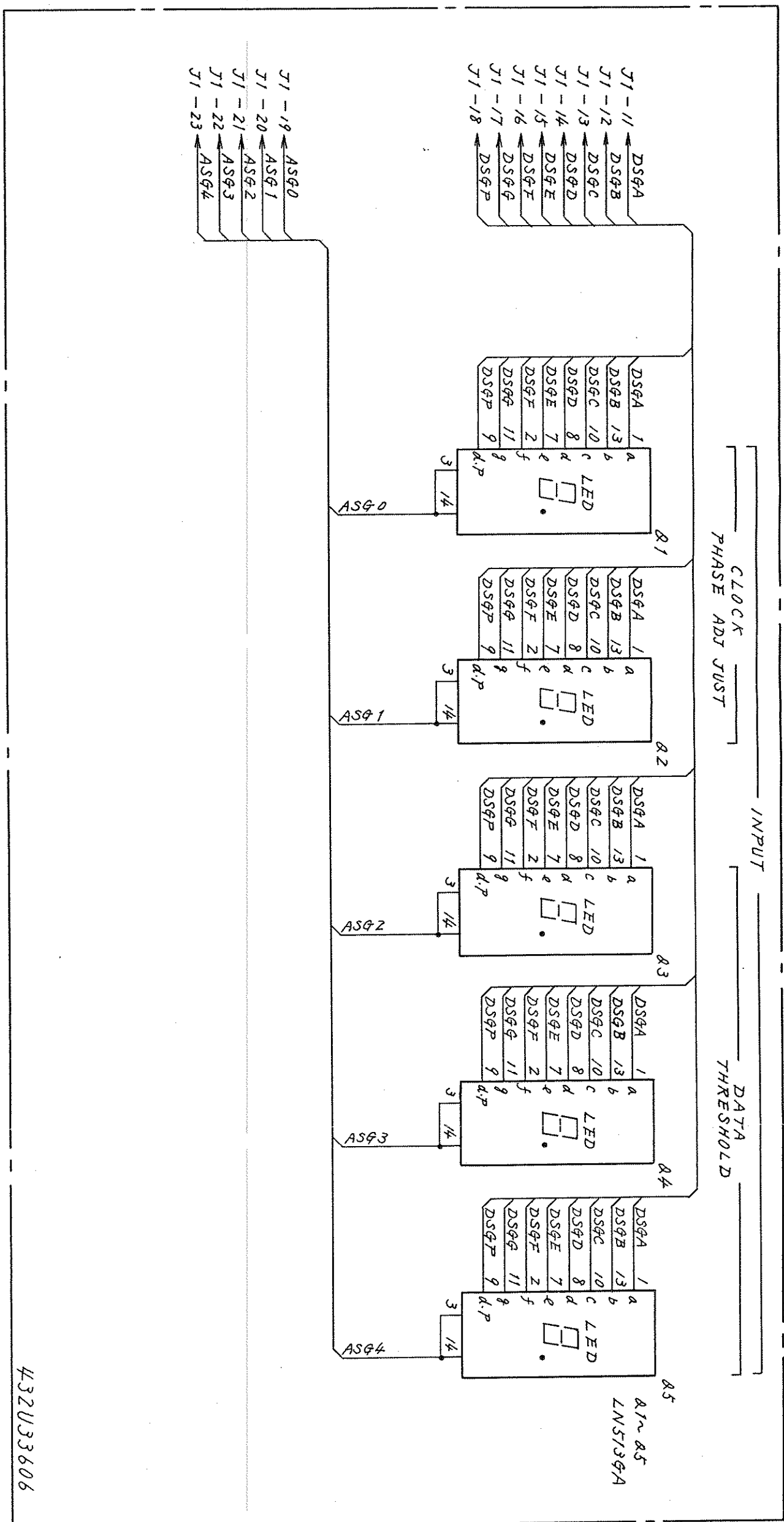
| | | | | | | | | |
|------------------|-----|---|---|---|---|---|---|---|
| No. 0023-1985-08 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 43 33618 | 5/5 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| ANRITSU CORP. | | | | | | | | |

3-181

3.6.6 MH677A Z6 Display PC board **16** , Z13 GP-IB
PC board **17** , and Z14 RS-232C PC board **18**

Fig. 3-64 Parts Layout of MH677A Z6 Display
16 PC Board





432U33606

- J1-19 ← ASQ0
- J1-20 ← ASQ1
- J1-21 ← ASQ2
- J1-22 ← ASQ3
- J1-23 ← ASQ4

DEP

| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----------------------------|---------------------------|--------------|----------|--------|
| CHECKED BY | TRACED BY | SCALE | | |
| APPROVED BY | DRAWN BY <i>Miyakuchi</i> | | | |
| TITLE | | DRAWING No. | | |
| Z6 DISPLAY Circuit Diagram. | | 43W33621 1/2 | | |

16

Parts List 44W83355

No. 0023-1985-08

43W33621 1/2

2

3

4

5

6

7

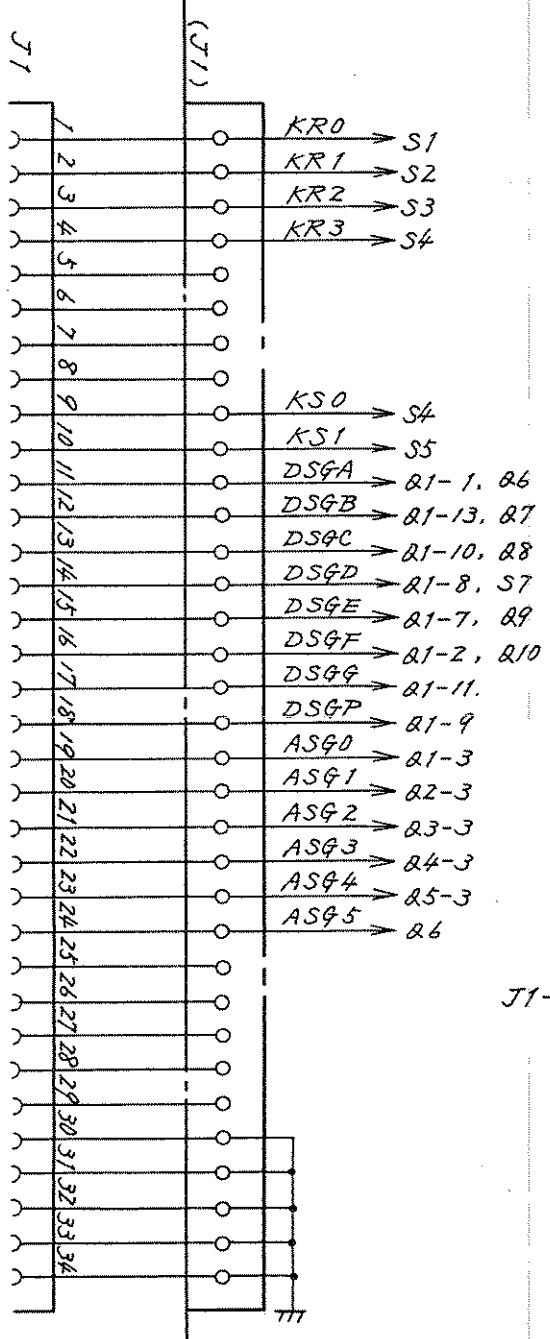
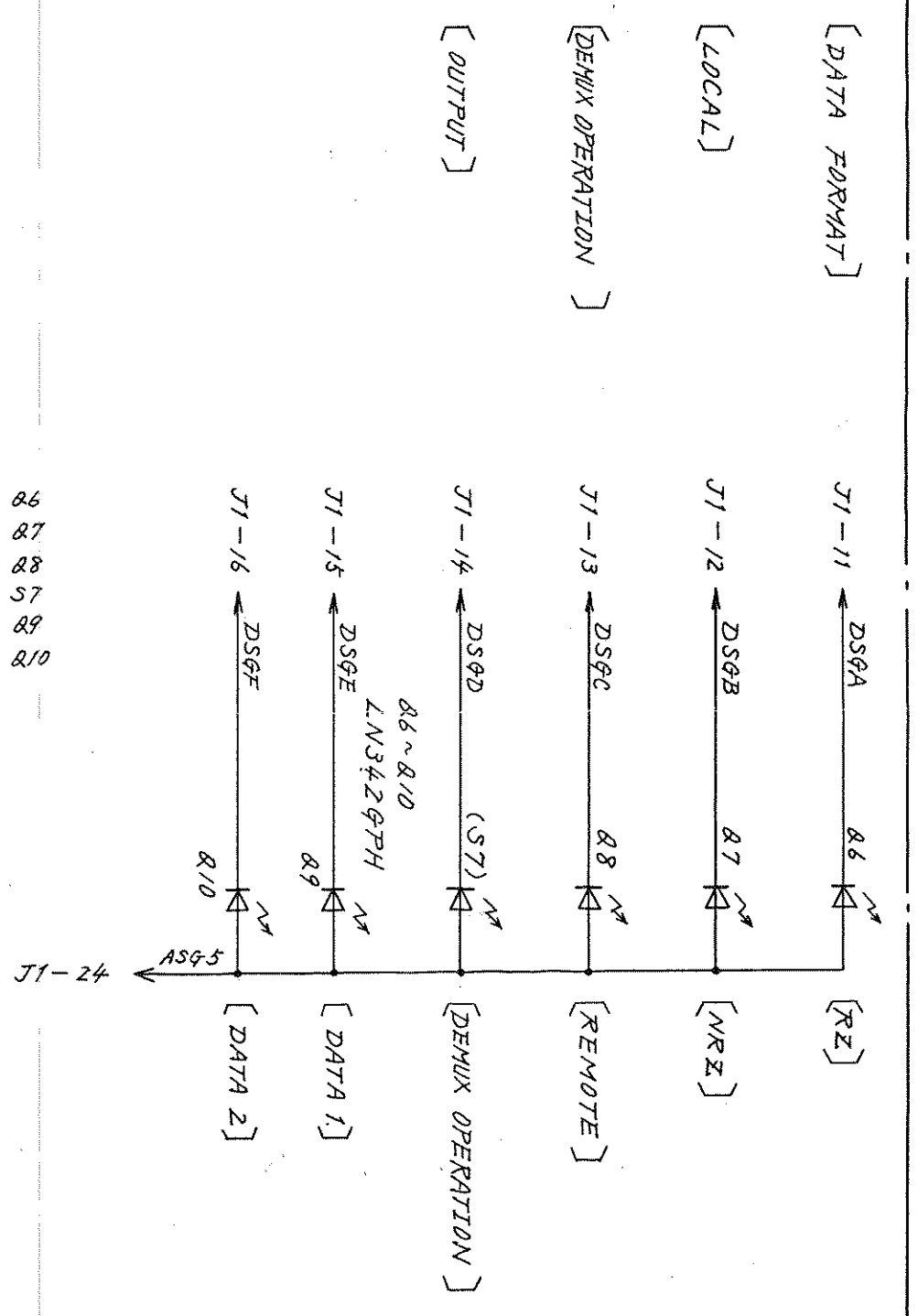
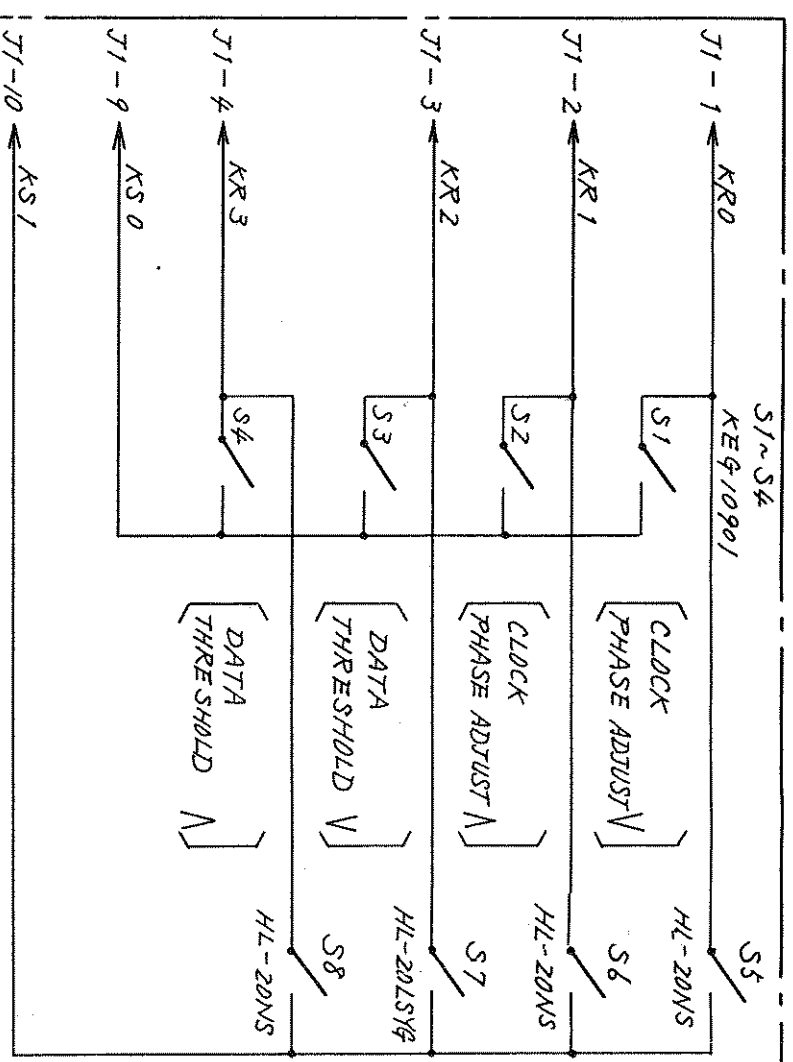
8

ANRITSU CORP.

3-183/3-184

APPLICATION

REVISIONS



DEP

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----------------------------|-------------|----------|---------------------------|-------------|--------|
| | CHECKED BY | | TRACED BY | | |
| | APPROVED BY | | DRAWN BY <i>Miyakuchi</i> | | |
| TITLE | | | | DRAWING No. | |
| Z6 DISPLAY Circuit Diagram. | | | | 43 W33621 | 2/2 |

16

No. 0023-1985.08

ANRITSU CORP.

3-185

43 W33621 2/2

2

3

4

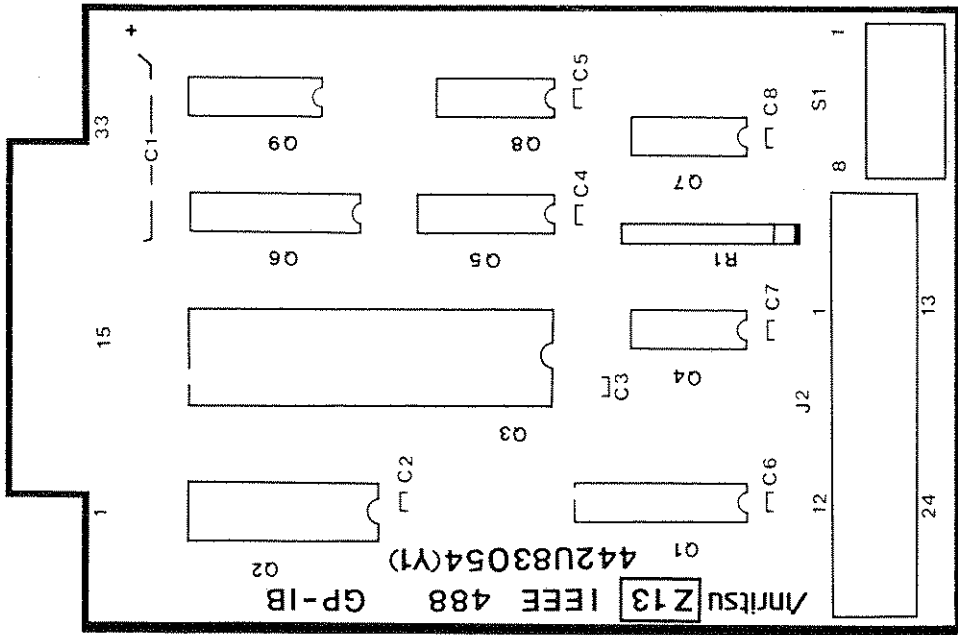
5

6

7

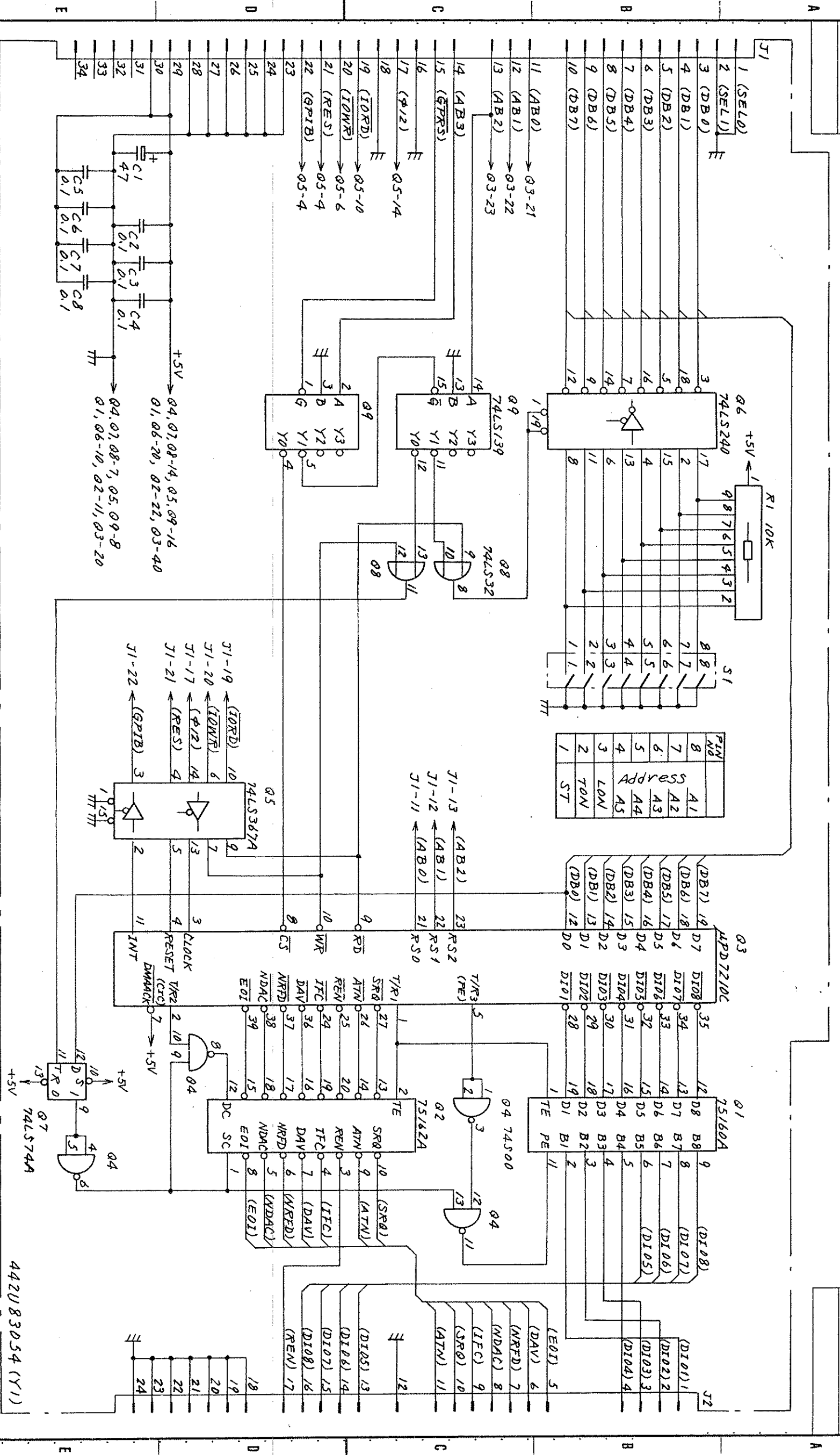
8

Fig. 3-65 Parts Layout of Z13 GP-1B Board **17**



APPLICATION

REVISIONS



PARTS LIST 44W83048

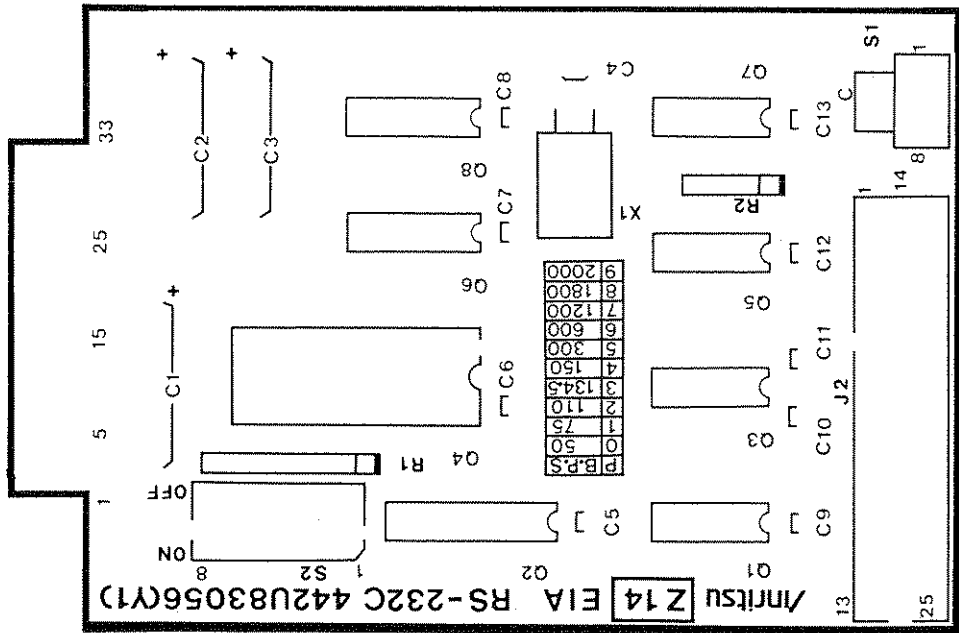
| QTY/ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|----------|----------|-------------|----------|--------|
| | | | | |
| | | | | |
| | | | | |

TITLE Z13 GP-1B
Circuit Diagram

ANRITSU CORP.

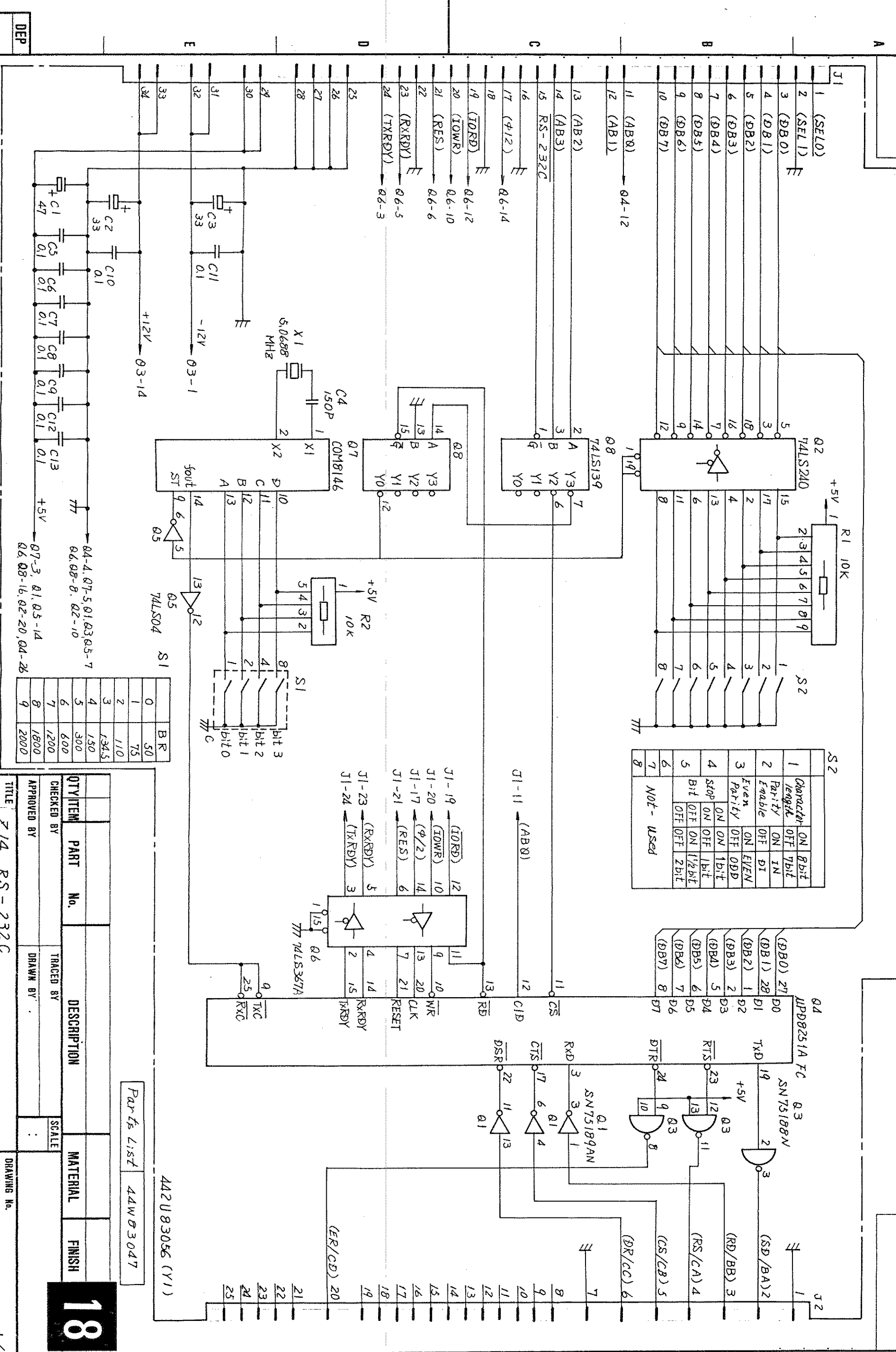
17

Fig. 3-66 Parts Layout of Z14 RS-232 PC Board



APPLICATION

REVISIONS



| Character length | ON | Bit |
|------------------|-----|-----------|
| 1 | ON | 7bit |
| 2 | OFF | IN |
| 3 | OFF | DI |
| 4 | ON | EVEN |
| 5 | OFF | ODD |
| 6 | ON | 1bit |
| 7 | OFF | 1 1/2 bit |
| 8 | OFF | 2bit |

| Character length | ON | Bit |
|------------------|-----|-----------|
| 1 | ON | 7bit |
| 2 | OFF | IN |
| 3 | OFF | DI |
| 4 | ON | EVEN |
| 5 | OFF | ODD |
| 6 | ON | 1bit |
| 7 | OFF | 1 1/2 bit |
| 8 | OFF | 2bit |

| QTY | ITEM | PART No. | DESCRIPTION | MATERIAL | FINISH |
|-----|------|----------|-------------|----------|--------|
| 1 | 0 | 50 | BR | | |
| 1 | 1 | 75 | | | |
| 1 | 2 | 110 | | | |
| 1 | 3 | 134.5 | | | |
| 1 | 4 | 150 | | | |
| 1 | 5 | 300 | | | |
| 1 | 6 | 600 | | | |
| 1 | 7 | 1200 | | | |
| 1 | 8 | 1800 | | | |
| 1 | 9 | 2000 | | | |

Parts List 44WB3047

442U83056 (Y1)

| TITLE | APPROVED BY | CHECKED BY | TRACED BY | SCALE |
|-----------------|-------------|------------|-----------|-------|
| Z14 RS-232C | | | | |
| Circuit Diagram | | | | |

| DEP | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------|---|---|---|---|---|---|---|---|
| 43W33433 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

ANRITSU CORP. 3-189/3-190

18

This section contains information about ordering replacement parts of components. The following table shows circuit references (hereinafter: CKT REF) and abbreviations used for items in the Parts Lists. The quantity of each item in the Parts List is "one" unless a quantitative description is given in the "NOTE" column.

4.1 Introduction

REPLACABLE PARTS

SECTION 4

(1) Circuit reference

| | | | | | | | |
|-----|--------------------------|----|------------------------|----|--|----|---------------------------|
| AT: | Attenuator | K: | Relay | Q: | Transistor, diode, IC, rectifier | V: | Neon lamp, vacuum tube |
| C: | Capacitor | L: | Coil, microinductor | R: | Resistor | X: | Crystal OSC |
| F: | Fuse | M: | Meter, timer | S: | Switch | Z: | Unit |
| J: | Jack, plug, connector | P: | Lamp | T: | Transformer | | |

(2) Abbreviations

| | | | |
|----------------|---|----------|------------------------------------|
| A: | amperes | Multi: | multiplying |
| Att, R var: | variable attenuator using film elements | N-ch: | N-channel |
| BL: | boundary layer | non-lin: | non-linear taper |
| Cer: | ceramic | Non-pol: | non polarity |
| CF: | carbon film | NPN: | negative-positive-negative |
| Comp: | composition | Q: | ohms |
| CRT: | cathode-ray tube | p: | pico ($\times 10^{-12}$) |
| D1: | diode | Plast: | plastic film |
| DIP: | dual in-line package | PMT: | potentiometer |
| Elect: | electrolytic aluminum | PNP: | positive-negative-positive |
| F: | farad | P-p: | peak-to-peak value |
| FET: | field-effect transistor | RFC: | RF choke |
| G: | ground | R-lamp: | resistor lamp |
| Ge: | germanium | rms: | effective value (root-mean-square) |
| H: | henry | SBD: | Schotky barrier diode |
| HZ: | hertz | SCR: | silicon-controlled rectifier |
| IC: | integrated circuit | Si: | silicon |
| IEC: | Conforms to IEC safety standards. | SRD: | step-recovery diode |
| J-FET: | Junction FET | Tant: | tantalum |
| K: | kilo ($\times 10^3$) | Tr: | transistor |
| LED: | light-emitting diode | Trans: | transformer |
| M: | mega ($\times 10^6$) | U: | micro ($\times 10^{-6}$) |
| m: | milli ($\times 10^{-3}$) | V: | volt |
| MF: | metallized film | Var: | variable |
| MOS-FET: | metal-oxide semiconductor FET | WM: | wire-wound |
| M paper: | metallized paper | XTAL: | crystal |
| M plast: | metallized plastic film | | |

4.2 Reading Capacitors/Resistors
 4.2.1 Capacitor Identification

For Examples:

10 Ω, +5%
 10 × 10⁰ +5%
 black, black, brown, gold

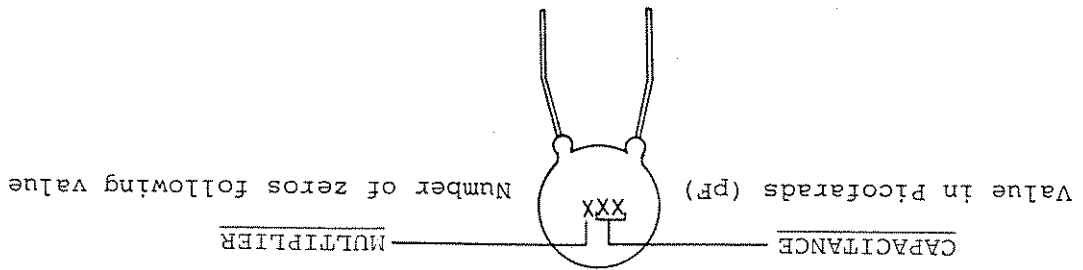
1 kΩ, +5%
 10 × 10² +5%
 black, red, black, gold, brown

14.0 Ω, +0.5%
 140 × 10⁻¹ +0.5%
 black, yellow, gold, brown, green

| COLOR | Figure | | Multiplier | Tolerance |
|--------|--------|-----|-------------------|-----------|
| | 1st | 2nd | | |
| Black | 0 | 0 | x10 ⁰ | - |
| Brown | 1 | 1 | x10 ¹ | - |
| Red | 2 | 2 | x10 ² | - |
| Orange | 3 | 3 | x10 ³ | - |
| Yellow | 4 | 4 | x10 ⁴ | - |
| Green | 5 | 5 | x10 ⁵ | +0.5% |
| Blue | 6 | 6 | x10 ⁶ | - |
| Purple | 7 | 7 | x10 ⁷ | - |
| Grey | 8 | 8 | x10 ⁸ | - |
| White | 9 | 9 | x10 ⁹ | - |
| Gold | - | - | x10 ⁻¹ | +5% |
| Silver | - | - | x10 ⁻² | +10% |
| ---- | - | - | - | +20% |

1st Band
 2nd Band
 (2nd+1) Band
 3rd Band
 4th Band

4.2.2 Resistor Identification

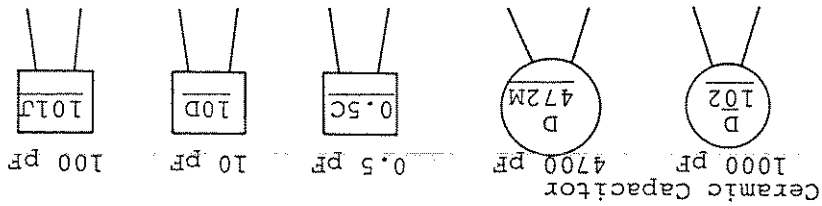


EXAMPLES: 103 = 10,000 PF = 10^{-8} F or 0.01 μ F
 302 = 3,000 PF = 3×10^{-9} F or 0.003 μ F
 676 = 67,000,000 PF = 67×10^{-6} F or 67 μ F

(a) Ceramic and polyester capacitors

| | | | | | | | |
|------------|--------|------|-------|--------|---------|--------------|-------------|
| Indication | 0.5 | 1 | 10 | 101 | 102 | 103 | 104 |
| Capacity | 0.5 pF | 1 pF | 10 pF | 100 pF | 1000 pF | 0.01 μ F | 0.1 μ F |

Example:



(b) Tantalum, metallized, and electrolytic capacitors

| | | | | |
|------------|--------------|-----------|------------|-------------|
| Indication | OR47 | 010 | 100 | 101 |
| Capacity | 0.47 μ F | 1 μ F | 10 μ F | 100 μ F |

4.3 Ordering Information

When ordering parts, please give the following descriptions by referring to the Parts List.

Table 4-1 Ordering Information

| (1) | Name of Instrument | MULTI PLEXER MH676A |
|--|--------------------------|--------------------------|
| (2) | Name of Parts List | Parts List: Z2 MUX INPUT |
| (3) | CKT REF | C3 |
| (4) | Name of Part | CK733BH473K |
| Note: | | |
| Parts name is given in parentheses () in the Parts List. Parts with asterisk (*) are those that require factory adjustment after repair. When ordering a part or parts with an asterisk, give a full description of the part. | | |
| (5) | Quantity | 1 |
| (6) | Serial No. of Instrument | M31257 |
| Item | Example | |

4-6

44W83349 1/1

4-7

() : Manufacturer's part number
 * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|------------------------------------|--------|----------|
| G 1 | | Gan, (FBP-06B-12L) | | |
| J 1 | | Connector, (PI011-03F) | | |
| J 2 | | Connector, (HIF3BA5B-34D-AA46S) | | |
| J 3 | | Connector, (HRM-208B) | | |
| J 4 | | Connector, (HRM-208B) | | |
| J 5 | | Connector, (HRM-208B) | | |
| J 6 | | Connector, (NM11-2F) | | |
| J 7 | | Connector, (NM11-2F) | | |
| J 8 | | Connector, (NM11-2F) | | |
| J 9 | | Connector, (NM11-2F) | | |
| J 10 | | Connector, (NM11-2F) | | |
| J 11 | | Connector, (NM11-2F) | | |
| J 12 | | Connector, (BNC-PJ2-NI) | | |
| J 13 | | Connector, (BNC-PJ2-NI) | | |
| J 14 | | Connector, (BNC-PJ2-NI) | | |
| J 15 | | Connector, (NM27-2F) | | |
| J 16 | | Connector, (NM27-2F) | | |
| J 17 | | Connector, (HRM556S) | | |
| J 18 | | Connector, (HRM556S) | | |
| Z 1 | | MUX OUTPUT | | 44W83350 |
| Z 2 | | MUX INPUT | | 44W83351 |
| Z 3 | | CONTROL | | 44W83352 |
| Z 4 | | POWER SUPPLY | | 44W83353 |
| Z 5 | | MOTHER BOARD | | 44W83354 |
| Z 6 | | DISPLAY | | 44W83360 |
| Z 7 | | Not assigned | | |
| Z 8 | | Not assigned | | |
| Z 9 | | Not assigned | | |
| Z 10 | | Not assigned | | |
| Z 11 | | Not assigned | | |
| Z 12 | | Not assigned | | |
| Z 13 | | GP-IB | | 44W83046 |
| Z 14 | | RS-232C | | 44W83047 |

() : Manufacturer's part number
 * : Selected at factory
 4-8

44W83354 1/1

| CKT REF | DESCRIPTION | RATING | NOTE |
|---------|--------------------------------|--------|------|
| J 1 | Connector, (225J-23621-587) | | |
| J 2 | Connector, (225J-23621-587) | | |
| J 3 | Connector, (225J-23621-587) | | |
| J 4 | Connector, (225J-23621-587) | | |
| J 5 | Pattern (225J-23621-587) | | |

44W83353 1/4

() : Manufacturer's part number
 * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|--|--|----------------|
| C 1 | | Cer, (CK924FH104Z) Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V 0.1µF, +80/-20%, 50V | |
| C 2 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 3 | | Elect, (ECEB1HG221S) | 220µF, +50/-20%, 50V | |
| C 4 | | Elect, (ECEB1HG221S) | 220µF, +50/-20%, 50V | |
| C 5 | | Elect, (ECEB1HG221S) | 220µF, +50/-20%, 50V | |
| C 6 | | Elect, (ECEB1HG221S) | 220µF, +50/-20%, 50V | |
| C 7 | | Cer, (CK924CIH * M) | 1000p to 0.1µF, ±20%, 50V | 0'ty 0 to 2, * |
| C 8 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 9 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 10 | | Cer, (CK924CIH * M) | 1000p to 0.1µF, ±20%, 50V | 0'ty 0 to 2, * |
| C 11 | | Cer, (CK924CIH * M) | 1000p to 0.1µF, ±20%, 50V | 0'ty 0 to 2, * |
| C 12 | | Elect, (CE04CIJ4R7) | 4.7µF, ±20%, 63V | |
| C 13 | | Cer, (CC924CH1H221J) | 220pF, ±5%, 50V | |
| C 14 | | Elect, (CE04CIJ2R2) | 2.2µF, ±20%, 63V | |
| C 15 | | Elect, (CE04CIJ2R2) | 2.2µF, ±20%, 63V | |
| C 16 | | Elect, (ECEB1HG221S) | 220µF, +50/-20%, 50V | |
| C 17 | | Elect, (CE02CIJ101) | 100µF, ±20%, 63V | |
| C 18 | | Elect, (ECEB1HG221S) | 220µF, +50/-20%, 50V | |
| C 19 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 20 | | Elect, (CE04CI330) | 33µF, ±20%, 16V | |
| C 21 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 22 | | Elect, (CE04CI330) | 33µF, ±20%, 16V | |
| C 23 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 24 | | Elect, (CE04CI470) | 47µF, ±20%, 10V | |
| C 25 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 26 | | Elect, (ECEB1AG102S) | 1000µF, +50/-20%, 10V | |
| C 27 | | Cer, (CK924FH104Z) | 0.1µF, +80/-20%, 50V | |
| C 28 | | Plast, (ECQ-PI * FZ) | 1000p to 0.0168µF, ±1%, 50V | 0'ty 0 or 1, * |
| C 29 | | Elect, (ECEB1CG102S) | 1000µF, +50/-20%, 16V | |
| C 30 | | Elect, (ECEB1CG102S) | 1000µF, +50/-20%, 16V | |
| C 31 | | Elect, (ECEB1CG102S) | 1000µF, +50/-20%, 16V | |
| C 32 | | Elect, (ECEB1AG102S) | 1000µF, +50/-20%, 10V | |
| F 1 | | Fuse, (MF51NN250V) | 250V, 0.5A | |
| F 2 | | Fuse, (MF51NN250V) | 250V, 0.5A | |
| F 3 | | Fuse, (MF51NN250V) | 250V, 2A | |
| F 4 | | Fuse, (MF51NN250V) | 250V, 2A | |

44W83353 2/4

4-10

() : Manufacturer's part number * : Selected at factory

| REF | DESCRIPTION | RATING | NOTE |
|-----|---------------------------|----------------------|------|
| Q1 | IC, (MPC16312H) | | |
| Q2 | IC, (MPC14312H) | | |
| Q3 | DI, (1S1300) | | |
| Q4 | IC, (MPC451C) | | |
| Q5 | DI, (02B2.2) | | |
| Q6 | IC, (PC618) | | |
| Q7 | Not assigned | | |
| Q8 | IC, (S10SC4MR) | | |
| Q9 | IC, (MPC1042C) | | |
| Q10 | Rectifier, (S5KC20HR) | | |
| Q11 | Rectifier, (S5KC20H) | | |
| Q12 | Rectifier, (S5KC20H) | | |
| Q13 | Rectifier, (S5KC20H) | | |
| Q14 | DI, (V03G) | | |
| Q15 | DI, breakdown, (RD13EB) | 12.4 to 14.1V, 400mW | |
| Q16 | Tr, (2SC1008L) | 8.5 to 9.6V, 1W | |
| Q17 | DI, breakdown, (RD9.1FB) | 10.4 to 11.6V, 1W | |
| Q18 | DI, breakdown, (RD11FB) | | |
| Q19 | IC, (S10SC4M) | | |
| Q20 | Tr, (2SA780AK) | | |
| Q21 | Tr, (2SA780AK) | | |
| Q22 | Not assigned | | |
| Q23 | Tr, (2SC3164) | | |
| Q24 | DI, (1S955) | | |
| Q25 | DI, (1S955) | | |
| Q26 | Tr, (2SC3164) | | |
| Q27 | DI, (1S955) | | |
| F5 | Fuse, (MFS1NN250V ZADC01) | 250V, 2A | |
| J1 | Pattern | | |
| J2 | Connector, (PI-021-03M) | | |
| L1 | Coil, (HP-023) | | |
| L2 | Coil, (HP-023) | | |
| L3 | Coil, (LH1-471K) | | |
| L4 | Coil, (LH1-471K) | | |
| L5 | Coil, (SC-10-100) | | |
| L6 | Coil, (SKL-103A) | | |
| L7 | Coil, (SKL-103A) | | |

44W83353 3/4

() : Manufacturer's part number * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|-------------------------------|---------------------------------------|----------------|
| R 1 | | Not assigned | | |
| R 2 | | Not assigned | | |
| R 3 | | Not assigned | | |
| R 4 | | MF, (RN14K2H33J) | 3.3K Ω , \pm 5%, 1/2W | |
| R 5 | | CF, (ARD25T102J) | 1K Ω , \pm 5%, 1/4W | |
| R 6 | | Var, MF, (RJ-6S 1K Ω) | 1K Ω , 1/2W | |
| R 7 | | CF, (ARD25T471J) | 470 Ω , \pm 5%, 1/4W | |
| R 8 | | CF, (ARD25T * J) | 4.7 to 100K Ω , \pm 5%, 1/4W | 0'ty 1 to 3, * |
| R 9 | | CF, (ARD25T103J) | 10K Ω , \pm 5%, 1/4W | 0'ty 1 to 3, * |
| R 10 | | CF, (ARD25T * J) | 100K to 1M Ω , \pm 5%, 1/4W | 0'ty 1 to 3, * |
| R 11 | | CF, (ARD25T331J) | 330 Ω , \pm 5%, 1/4W | |
| R 12 | | Not assigned | | |
| R 13 | | CF, (ARD25T472J) | 4.7K Ω , \pm 5%, 1/4W | |
| R 14 | | CF, (ARD25T472J) | 4.7K Ω , \pm 5%, 1/4W | |
| R 15 | | CF, (ARD25T * J) | 22 to 100K Ω , \pm 5%, 1/4W | 0'ty 1 to 3, * |
| R 16 | | CF, (ARD25T473J) | 47K Ω , \pm 5%, 1/4W | |
| R 17 | | CF, (ARD25T223J) | 22K Ω , \pm 5%, 1/4W | |
| R 18 | | CF, (ARD25T472J) | 4.7K Ω , \pm 5%, 1/4W | |
| R 19 | | CF, (ARD25T * J) | 1 to 100K Ω , \pm 5%, 1/4W | 0'ty 1 to 3, * |
| R 20 | | CF, (ARD25T473J) | 47K Ω , \pm 5%, 1/4W | |
| R 21 | | Not assigned | | |
| R 22 | | CF, (ARD25T102J) | 1K Ω , \pm 5%, 1/4W | |
| R 23 | | CF, (ARD25T102J) | 1K Ω , \pm 5%, 1/4W | |
| R 24 | | MF, (RS1FB3.3K Ω J) | 3.3K Ω , \pm 5%, 1W | |
| R 25 | | CF, (ARD25T151J) | 150 Ω , \pm 5%, 1/4W | |
| R 26 | | MF, (RS2FB1K Ω J) | 1K Ω , \pm 5%, 2W | |
| R 27 | | CF, (ARD25T221J) | 220 Ω , \pm 5%, 1/4W | |
| R 28 | | MF, (RS1FB47 Ω J) | 47 Ω , \pm 5%, 1W | |
| R 29 | | Not assigned | | |
| R 30 | | CF, (ARD25T * J) | 10K to 1M Ω , \pm 5%, 1/4W | 0'ty 0 or 1, * |

4-12
 44W83353 4/4

() : Manufacturer's part number
 * : Selected at factory

| CKT REF | DESCRIPTION | RATING | NOTE |
|---------|---------------------|-----------------------|----------------|
| R31 | CF, (ARD25T470J) | 470, ±5%, 1/4W | Q'ty 1 to 2, * |
| R32 | CF, (ARD25T470J) | 470, ±5%, 1/4W | Q'ty 0 to 2, * |
| R33 | CF, (ARD25T * J) | 10 to 1000, ±5%, 1/4W | Q'ty 1 to 2, * |
| R34 | CF, (ARD25T * J) | 10 to 1000, ±5%, 1/4W | Q'ty 1 or 2, * |
| R35 | CF, (ARD25T * J) | 6.8 to 220, ±5%, 1/4W | Q'ty 0 to 2, * |
| R36 | CF, (ARD25T * J) | 5.8 to 220, ±5%, 1/4W | Q'ty 0 to 2, * |
| R37 | MF, (RS1FB220J) | 220, ±5%, 1W | |
| T 1 | Trans, (44T75381) | | |
| T 2 | Trans, (44T75381) | | |
| T 3 | Trans, (44T86386) | | |
| Z 1 | BATTERY, (ER6 (AA)) | | |

44W83352 1/3

() : Manufacturer's part number * : Selected at factory

| CMT REF | DESCRIPTION | RATING | NOTE |
|---------|------------------------------|-----------------------------|------|
| C 1 | Tant, (CS-E-1A4R7M) | 4.7 μ F, \pm 20%, 10V | |
| C 2 | Elect, (CE02C1G101) | 100 μ , \pm 20%, 16V | |
| C 3 | Elect, (CE02C1G101) | 100 μ , \pm 20%, 16V | |
| C 4 | Elect, (CE02C1A101) | 100 μ , \pm 20%, 10V | |
| C 5 | | | |
| C24 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C25 | Tant, (CS-E-1D2R2M) | 2.2 μ F, \pm 20%, 20V | |
| C26 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C27 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C28 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C29 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C30 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C31 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C32 | Cer, (CK924C1H104M) | 0.1 μ F, \pm 20%, 50V | |
| C33 | Tant, (CS-E-1D2R2M) | 2.2 μ F, \pm 20%, 20V | |
| C34 | Cer, (CG924CH1H471J) | 470pF, \pm 5%, 50V | |
| C35 | Cer, (CG924CH1H471J) | 470pF, \pm 5%, 50V | |
| J 1 | Connector, (HIF3-34P-2.54DS) | | |
| J 2 | Connector, (HIF3-34P-2.54DS) | | |
| J 3 | Pattern (HIF3-34P-2.54DS) | | |
| Q 1 | Tr, (2SC2901) | | |
| Q 2 | IC, (74LS14) | | |
| Q 3 | IC, (uPA79C) | | |
| Q 4 | IC, (uPD8279C-2) | | |
| Q 5 | IC, (LH0082A) | | |
| Q 6 | IC, (HA17008RP) | | |
| Q 7 | IC, (74LS244) | | |
| Q 8 | IC, (74LS244) | | |
| Q 9 | IC, (HM6264LP-15) | | |
| Q10 | IC, (uPD8255AC-2) | | |
| Q11 | IC, (HA17008RP) | | |
| Q12 | IC, (uPC451C) | | |
| Q13 | IC, (74154) | | |
| Q14 | IC, (BM2764-25) | | |
| Q15 | IC, (uPD8255AC-2) | | |
| Q16 | IC, (HA17008RP) | | |
| Q17 | IC, (HA17008RP) | | |
| Q18 | IC, (74LS244) | | |

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|-------------------------------------|-----------------------------------|------|
| Q19 | to | Tr, (2SA952) | | |
| Q29 | | | | |
| Q30 | | IC, (74LS244) | | |
| Q31 | | IC, (74LS123) | | |
| Q32 | | IC, (TL7705CPB) | | |
| Q33 | | IC, (74LS245) | | |
| Q34 | | IC, (74LS32) | | |
| Q35 | | IC, (74LS14) | | |
| Q36 | | IC, (74LS11) | | |
| Q37 | | IC, (74LS138) | | |
| Q38 | | IC, (74LS244) | | |
| Q39 | | IC, (74LS139) | | |
| Q40 | | IC, (74LS244) | | |
| Q41 | | IC, (MPD780C-1) | | |
| Q42 | | IC, (TC4093BP) | | |
| Q43 | | IC, (74LS245) | | |
| Q44 | | IC, (74LS244) | | |
| Q45 | | IC, (MPC1251C) | | |
| Q46 | | D1, breakdown, (1S752) | 5.9 to 6.5V, 250mW | |
| Q47 | | D1, (1S953) | | |
| Q48 | | IC, (7438) | | |
| Q49 | | IC, (74LS74A) | | |
| R1 | | Single in-line array, (IHR-8-472JA) | 4.7K Ω x 8, 1/8W | |
| R2 | | CF, (ARD25T102J) | 1K Ω , \pm 5%, 1/4W | |
| R3 | | CF, (ARD25T222J) | 2.2K Ω , \pm 5%, 1/4W | |
| R4 | | Single in-line array, (IHR-8-220JB) | 22 Ω x 8, 1/8W | |
| R5 | | MF, (RN14K2E2001D) | 2K Ω , \pm 0.5%, 1/4W | |
| R6 | | Single in-line array, (IHR-4-103JA) | 10K Ω x 4, 1/8W | |
| R7 | | Single in-line array, (IHR-8-223JA) | 22K Ω x 8, 1/8W | |
| R8 | | CF, (ARD25T222J) | 2.2K Ω , \pm 5%, 1/4W | |
| R9 | | MF, (RN14K2E2001D) | 2.00K Ω , \pm 0.5%, 1/4W | |
| R10 | | MF, (RN14K2E4991D) | 4.99K Ω , \pm 0.5%, 1/4W | |
| R11 | | MF, (RN14K2E4991D) | 4.99K Ω , \pm 0.5%, 1/4W | |
| R12 | | MF, (RN14K2E4991D) | 4.99K Ω , \pm 0.5%, 1/4W | |
| R13 | | MF, (RN14K2E4991D) | 4.99K Ω , \pm 0.5%, 1/4W | |
| R14 | | Single in-line array (IHR-6-331JB) | 330 Ω x 6, 1/8W | |
| R15 | | CF, (ARD25T222J) | 2.2K Ω , \pm 5%, 1/4W | |

() : Manufacturer's part number

* : Selected at factory

44W83352 2/3

44W83352 3/3

() : Manufacturer's part number
 * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|-------------------------------------|-------------------------------------|------|
| R16 | | MF, (RN14K2E2001D) | 2K Ω , $\pm 0.5\%$, 1/4W | |
| R17 | | CF, (ARD25T222J) | 2.2K Ω , $\pm 5\%$, 1/4W | |
| R18 | | MF, (RN14K2E2001D) | 2K Ω , $\pm 0.5\%$, 1/4W | |
| R19 | | Single in-line array, (IHR-6-103JA) | 10K Ω x 6, 1/8W | |
| R20 | | Single in-line array, (IHR-6-331JB) | 330 Ω x 6, 1/8W | |
| R21 | | Single in-line array, (IHR-6-103JA) | 10K Ω x 6, 1/8W | |
| R22 | | CF, (ARD25T104J) | 100K Ω , $\pm 5\%$, 1/4W | |
| R23 | | CF, (ARD25T102J) | 1K Ω , $\pm 5\%$, 1/4W | |
| R24 | | MF, (RN14K2E4991D) | 4.99K Ω , $\pm 0.5\%$, 1/4W | |
| R25 | | CF, (ARD25T151J) | 150 Ω , $\pm 5\%$, 1/4W | |
| R26 | | CF, (ARD25T103J) | 10K Ω , $\pm 5\%$, 1/4W | |
| R27 | | CF, (ARD25T103J) | 10K Ω , $\pm 5\%$, 1/4W | |
| R28 | | Var, MF, (RJ-6S 2K Ω) | 2K Ω , 1/2W | |
| R29 | | MF, (RN14K2E3011D) | 3.01K Ω , $\pm 0.5\%$, 1/4W | |
| R30 | | MF, (RN14K2E4991D) | 4.99K Ω , $\pm 0.5\%$, 1/4W | |
| R31 | | CF, (ARD25T102J) | 1K Ω , $\pm 5\%$, 1/4W | |
| R32 | | CF, (ARD25T102J) | 1K Ω , $\pm 5\%$, 1/4W | |
| R33 | | CF, (ARD25T472J) | 4.7K Ω , $\pm 5\%$, 1/4W | |
| S 1 | | Switch, (DIP-A(4)) | | |
| X 1 | | XTAL OSC, (TCO-707F(8MHZ)) | | |

44W83351 1/11

4-16

* : Selected at factory

() : Manufacturer's part number

| CRT | REF | DESCRIPTION | RATING | NOTE |
|-----|---------------------|--------------------|--------------------|------|
| C 1 | to | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C14 | to | | | |
| C15 | Not assigned | | | |
| C16 | Not assigned | | | |
| C17 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C18 | Cer, (CK732BH103K) | 0.01µF, ±10%, 50V | | |
| C19 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C20 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C21 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C22 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C23 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C24 | Cer, (CK732BH103K) | 0.01µF, ±10%, 50V | | |
| C25 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C26 | Not assigned | | | |
| C27 | to | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C40 | to | | | |
| C41 | Not assigned | | | |
| C42 | Not assigned | | | |
| C43 | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | | |
| C44 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C45 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C46 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C47 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C48 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C49 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C50 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C51 | Cer, (CK924CIH104M) | 0.1µF, ±20%, 50V | | |
| C52 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C53 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C54 | Cer, (CK924CIH104M) | 0.1µF, ±20%, 50V | | |
| C55 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C56 | Not assigned | | | |
| C57 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C58 | Cer, (CK924CIH104M) | 0.1µF, ±20%, 50V | | |
| C59 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C60 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C61 | Cer, (CK924CIH104M) | 0.1µF, ±20%, 50V | | |
| C62 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C63 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C64 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C65 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C66 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |
| C67 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | | |

44W83351 2/11

() : Manufacturer's part number
 * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|----------------------|--------------------|------|
| C68 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C69 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C70 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C71 | | Not assigned | | |
| C72 | | Not assigned | | |
| C73 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C74 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C75 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C76 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C77 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C78 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C79 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C80 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C81 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C82 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C83 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C84 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C85 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C86 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C87 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C88 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C89 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C90 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C91 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C92 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C93 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C94 | | Not assigned | | |
| C95 | | Not assigned | | |
| C96 | | Not assigned | | |
| C97 | | Not assigned | | |
| C98 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C108 | | | | |
| C109 | | Elect, (CE04W1E470) | 47µF, ±20%, 25V | |
| C110 | | Elect, (CE04W1E470) | 47µF, ±20%, 25V | |
| C111 | | Elect, (CE04W1A470) | 47µF, ±20%, 10V | |
| C112 | | Elect, (CE04W1A470) | 47µF, ±20%, 10V | |
| C113 | | Elect, (CE04W1V4R7) | 4.7µF, ±20%, 35V | |
| C114 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C115 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C116 | | Tant, (CS734E0J476M) | 470µF, ±20%, 6.3V | |
| C117 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C118 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C119 | | Tant, (CS732E1V105M) | 1µF, ±20%, 35V | |
| C120 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |

44W83351 3/11

4-18

() : Manufacturer's part number * : Selected at factory

| REF | DESCRIPTION | RATING | NOTE |
|------|-------------------------|------------------------|-----------------|
| C121 | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C122 | Cer, (CK732BH103K) | 0.01µF, ±10%, 50V | |
| C123 | Cer, (CK732CH1H * D) | 5 to 10pF, ±0.5pF, 50V | 0.1µF 1 to 3, * |
| C124 | Cer, (CK732CH1H * D) | 5 to 10pF, ±0.5pF, 50V | 0.1µF 1 to 3, * |
| C125 | Cer, (CC732CK1H020C) | 2pF, ±0.25pF, 50V | |
| C126 | Cer, (CC732CH1H060D) | 6pF, ±0.5pF, 50V | |
| C127 | Cer, (CC732CH1H060D) | 6pF, ±0.5pF, 50V | |
| C128 | Cer, (CC732CK1H020C) | 2pF, ±0.25pF, 50V | |
| C129 | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| C130 | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| J 1 | Pattern | | |
| J 2 | Connector, (HRM100-32S) | | |
| J 3 | Connector, (HRM100-32S) | | |
| J 4 | Connector, (HRM100-32S) | | |
| J 5 | Connector, (HRM100-32S) | | |
| J 6 | Connector, (HRM100-32S) | | |
| L 1 | Pattern | | |
| L 2 | Pattern | | |
| L 3 | Pattern | | |
| L 4 | Pattern | | |
| L 5 | Pattern | | |
| L 6 | Pattern | | |
| M 1 | Timer, (TM-O) | | |
| Q 1 | DI, (1S2835) | | |
| Q 2 | DI, (1S2837) | | |
| Q 3 | DI, (1S2835) | | |
| Q 4 | IC, (µPA102G) | | |
| Q 5 | DI, (1S953) | | |
| Q 6 | DI, (1S2837) | | |
| Q 7 | DI, (1S2835) | | |
| Q 8 | IC, (PA104G) | | |
| Q 9 | Tr, (ZSC3584) | | |
| Q 10 | Tr, (ZSC3584) | | |
| Q 11 | Tr, (ZSC3584) | | |
| Q 12 | DI, (1S2835) | | |
| Q 13 | IC, (µPA102G) | | |
| Q 14 | Not assigned | | |
| Q 15 | IC, (µPC1251C) | | |

44W83351 4/11

4-19

() : Manufacturer's part number
 * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|--------------------------------|--------|------|
| Q16 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q17 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q18 | | IC, (μPC1251C) Not assigned | | |
| Q19 | | Not assigned | | |
| Q20 | | DI, (1S2835) | | |
| Q21 | | DI, (1S2837) | | |
| Q22 | | DI, (1S2835) | | |
| Q23 | | IC, (μPA102G) | | |
| Q24 | | DI, (1S953) | | |
| Q25 | | DI, (1S2837) | | |
| Q26 | | DI, (1S2835) | | |
| Q27 | | IC, (μPA104G) | | |
| Q28 | | TR, (2SC3584) | | |
| Q29 | | TR, (2SC3584) | | |
| Q30 | | TR, (2SC3584) | | |
| Q31 | | DI, (1S2835) | | |
| Q32 | | IC, (μPA102G) | | |
| Q33 | | Not assigned | | |
| Q34 | | DI, (1S2835) | | |
| Q35 | | IC, (μPA102G) | | |
| Q36 | | DI, (1S2835) | | |
| Q37 | | IC, (μPA102G) | | |
| Q38 | | DI, (1S2835) | | |
| Q39 | | IC, (μPA102G) | | |
| Q40 | | TR, (2SC3584) | | |
| Q41 | | DI, (1S2835) | | |
| Q42 | | DI, (1S2835) | | |
| Q43 | | IC, (μPA102G) | | |
| Q44 | | DI, (1S959) | | |
| Q45 | | DI, (1S959) | | |
| Q46 | | IC, (μPC177C) | | |
| Q47 | | Not assigned | | |
| Q48 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q49 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q50 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q51 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q52 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q53 | | FET, (2SK406 (IDSS 50-65)) | | |

44W83351 5/11

* : Selected at factory

() : Manufacturer's part number

| REF | DESCRIPTION | RATING | NOTE |
|------|-----------------------|----------------------|----------------------|
| Q54 | Not assigned | | |
| Q55 | Tr, (2SA1154) | | |
| Q56 | IC, (uPC1251C) | | |
| Q57 | IC, (uPB582C) | | |
| Q58 | IC, (uPA102G) | | |
| Q59 | IC, (HD10231) | | |
| Q60 | Df, (1S953) | | |
| Q61 | IC, (HD10136) | | |
| Q62 | IC, (HD10125) | | |
| Q63 | IC, (uPC1251C) | | |
| Q64 | IC, (uPC1251C) | | |
| Q65 | IC, (74LS123) | | |
| Q66 | IC, (74LS74A) | | |
| Q67 | Not assigned | | |
| Q68 | | | |
| to | Df, (1S2208) | | |
| Q83 | | | |
| R 1 | Var, MF, (RJ-6P 500Ω) | 500Ω, 1/2W | |
| R 2 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R 3 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0 to 100Ω, ±5%, 1/8W |
| R 4 | MF, (RM73B2B820JD) | 82Ω, ±5%, 1/8W | |
| R 5 | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | 0 to 220Ω, ±5%, 1/8W |
| R 6 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0 to 100Ω, ±5%, 1/8W |
| R 7 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R 8 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R 9 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R 10 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R 11 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R 12 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R 13 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R 14 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R 15 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0 to 100Ω, ±5%, 1/8W |
| R 16 | MF, (RM73B2B * JD) | 0 to 221Ω, ±5%, 1/8W | 0 to 221Ω, ±5%, 1/8W |
| R 17 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R 18 | MF, (RM73B2B121JD) | 120Ω, ±5%, 1/8W | |
| R 19 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0 to 100Ω, ±5%, 1/8W |
| R 20 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0 to 100Ω, ±5%, 1/8W |

44W83351 6/11

4-21

() : Manufacturer's part number
 * : Selected at factory

| CRT REF | DESCRIPTION | RATING | NOTE |
|---------|--------------------------------|--------------------------------------|----------------|
| R21 | MF, (RM73B2B102JD) | 1K Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R22 | MF, (RM73B2B221JD) | 220 Ω , \pm 5%, 1/8W | |
| R23 | MF, (RM73B2B102JD) | 1K Ω , \pm 5%, 1/8W | |
| R24 | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R25 | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R26 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R27 | Var, MF, (RJ-6P 500 Ω) | 500 Ω , 1/2W | |
| R28 | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R29 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R30 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R31 | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R32 | MF, (RM73B2B471JD) | 470 Ω , \pm 5%, 1/8W | Q'ty 0 to 3, * |
| R33 | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | |
| R34 | MF, (RM73B2B820JD) | 82 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R35 | MF, (RM73B2B * JD) | 0 to 220 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R36 | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R37 | MF, (RM73B2B471JD) | 470 Ω , \pm 5%, 1/8W | |
| R38 | MF, (RM73B2B102JD) | 1K Ω , \pm 5%, 1/8W | |
| R39 | MF, (RM73B2B102JD) | 1K Ω , \pm 5%, 1/8W | |
| R40 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R41 | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R42 | Not assigned | | |
| R43 | MF, (RM73B2B821JD) | 820 Ω , \pm 5%, 1/8W | |
| R44 | MF, (RM73B2B152JD) | 1.5K Ω , \pm 5%, 1/8W | |
| R45 | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R46 | MF, (RM73B2B562JD) | 5.6K Ω , \pm 5%, 1/8W | |
| R47 | Var, MF, (RJ-6P 5K Ω) | 5K Ω , 1/2W | |
| R48 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R49 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R50 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R51 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R52 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R53 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R54 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R55 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R56 | MF, (RM73B2B * JD) | 100 to 470 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R57 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R58 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |

44W83351 7/11 4-22

() : Manufacturer's part number * : Selected at factory

| REF | DESCRIPTION | RATING | NOTE |
|-----|-----------------------|----------------------|---------------------|
| R59 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R60 | MF, (RM63B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R61 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R62 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R63 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R64 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R65 | Var, MF, (RJ-6P 5kΩ) | 5kΩ, 1/2W | |
| R66 | MF, (RM73B2B562JD) | 5.6kΩ, ±5%, 1/8W | |
| R67 | MF, (RM73B2B821JD) | 820Ω, ±5%, 1/8W | |
| R68 | Var, MF, (RJ-6P 1kΩ) | 1kΩ, 1/2W | |
| R69 | MF, (RM73B2B152JD) | 1.5kΩ, ±5%, 1/8W | |
| R70 | Not assigned | | |
| R71 | Not assigned | | |
| R72 | Var, MF, (RJ-6P 500Ω) | 500Ω, 1/2W | |
| R73 | MF, (RM73B2B222JD) | 2.2kΩ, ±5%, 1/8W | |
| R74 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 1 or 1, * |
| R75 | MF, (RM73B2B820JD) | 82Ω, ±5%, 1/8W | 0'ty 1 or 1, * |
| R76 | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | 0'ty 1 or 1, * |
| R77 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 1 or 1, * |
| R78 | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R79 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R80 | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R81 | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R82 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R83 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R84 | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R85 | MF, (RM73B2B222JD) | 2.2kΩ, ±5%, 1/8W | |
| R86 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 0, * 3, * |
| R87 | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | 0'ty 0 to 0, * 3, * |
| R88 | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R89 | MF, (RM73B2B121JD) | 120Ω, ±5%, 1/8W | |
| R90 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 0, * 3, * |
| R91 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 0, * 3, * |
| R92 | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R93 | MF, (RM73B2B221JD) | 220Ω, ±5%, 1/8W | |
| R94 | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R95 | MF, (RM73B2B222JD) | 2.2kΩ, ±5%, 1/8W | |
| R96 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 1 or 1, * |

44W83351 8/11

() : Manufacturer's part number
 * : Selected at factory

| REF | DESCRIPTION | RATING | NOTE |
|------|-----------------------|----------------------|----------------|
| R97 | MR, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | 0'ty 1 or 1, * |
| R98 | Var, MF, (RJ-6P 500Ω) | 500Ω, 1/2W | |
| R99 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 1 or 1, * |
| R100 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R101 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R102 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 1 or 1, * |
| R103 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R104 | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R105 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 3, * |
| R106 | MF, (RM73B2B820JD) | 82Ω, ±5%, 1/8W | |
| R107 | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | 0'ty 0 to 3, * |
| R108 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 3, * |
| R109 | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R110 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R111 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R112 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R113 | Not assigned | | |
| R114 | Not assigned | | |
| R115 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R116 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 3, * |
| R117 | MF, (RM73B2B152JD) | 1.5KΩ, ±5%, 1/8W | |
| R118 | MF, (RM73B2B101JD) | 100Ω, ±5%, 1/8W | |
| R119 | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | 0'ty 0 to 3, * |
| R120 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 3, * |
| R121 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R122 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R123 | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R124 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R125 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R126 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R127 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R128 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0'ty 0 to 3, * |
| R129 | MF, (RM73B2B820JD) | 82Ω, ±5%, 1/8W | |
| R130 | MF, (RM73B2B * JD) | 0 to 221Ω, ±5%, 1/8W | 0'ty 0 to 3, * |

44W83351 9/11

4-24

* : Selected at factory

() : Manufacturer's part number

| REF | DESCRIPTION | RATING | NOTE |
|------|--------------------|----------------------|----------------|
| R131 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R132 | MF, (RM73B2B561JD) | 560Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R133 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R134 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R135 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R136 | MF, (RM73B2B561JD) | 560Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R137 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R138 | MF, (RM73B2B561JD) | 560Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R139 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R140 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R141 | MF, (RM73B2B820JD) | 82Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R142 | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R143 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R144 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R145 | MF, (RM73B2B561JD) | 560Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R146 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R147 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R148 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R149 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R150 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R151 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R152 | MF, (RM73B2B820JD) | 82Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R153 | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R154 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R155 | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R156 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R157 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R158 | MF, (RM73B2B331JD) | 330Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R159 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R160 | MF, (RM73B2B104JD) | 100KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R161 | MF, (RM73B2B331JD) | 330Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R162 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R163 | MF, (RM73B2B332JD) | 3.3KΩ, ±5%, 1/8W | Q'ty 0 to 3, * |
| R164 | Not assigned | | |
| R165 | Not assigned | | |
| R166 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | Q'ty 0 to 3, * |
| R167 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | Q'ty 0 to 3, * |

44W83351 10/11

* : Selected at factory

() : Manufacturer's part number

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|-------------------------------|--------------------------------------|--------------------------------------|
| R168 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R169 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R170 | | MF, (RM73B2B222JD) | 2.2K Ω , $\pm 5\%$, 1/8W | |
| R171 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R172 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R173 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R174 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R175 | | MF, (RM73B2B471JD) | 470 Ω , $\pm 5\%$, 1/8W | |
| R176 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R177 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R178 | | MF, (RM73B2B222JD) | 2.2K Ω , $\pm 5\%$, 1/8W | |
| R179 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R180 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R181 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R182 | | MF, (RM73B2B101JD) | 100 Ω , $\pm 5\%$, 1/8W | |
| R183 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R184 | | MF, (RM73B2B222JD) | 2.2K Ω , $\pm 5\%$, 1/8W | |
| R185 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R186 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R187 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R188 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R189 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R190 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R191 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R192 | | MF, (RM73B2B471JD) | 470 Ω , $\pm 5\%$, 1/8W | |
| R193 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R194 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R195 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R196 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R197 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R198 | | MF, (RM73B2B222JD) | 2.2K Ω , $\pm 5\%$, 1/8W | |
| R199 | | Not assigned | | |
| R200 | | Not assigned | | |
| R201 | | MF, (RM73B2B332JD) | 3.3K Ω , $\pm 5\%$, 1/8W | |
| R202 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R203 | | MF, (RM73B2B222JD) | 2.2K Ω , $\pm 5\%$, 1/8W | |
| R204 | | MF, (RM73B2B222JD) | 2.2K Ω , $\pm 5\%$, 1/8W | |
| R205 | | MF, (RM73B2B101JD) | 100 Ω , $\pm 5\%$, 1/8W | |
| R206 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R207 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R208 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R209 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R210 | | MF, (RM73B2B272JD) | 2.7K Ω , $\pm 5\%$, 1/8W | |
| R211 | | MF, (RM73B2B222JD) | 2.2K Ω , $\pm 5\%$, 1/8W | |
| R212 | | MF, (RM73B2B * JD) | 0 to 100 Ω , $\pm 5\%$, 1/8W | 0 to 100 Ω , $\pm 5\%$, 1/8W |

Qty 0 to 3, *

44W83351 11/11

() : Manufacturer's part number * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|-----------------------|----------------------|-----------|
| R213 | | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | 0 to 3, * |
| R214 | | MF, (RM73B2B121JD) | 120Ω, ±5%, 1/8W | 0 to 3, * |
| R215 | | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | 0 to 3, * |
| R216 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R217 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R218 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R219 | | MF, (RM73B2B332JD) | 3.3KΩ, ±5%, 1/8W | |
| R220 | | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R221 | | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R222 | | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R223 | | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R224 | | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |
| R225 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R226 | | MF, (RN14K2E4751D) | 4.75KΩ, ±0.5%, 1/4W | |
| R227 | | MF, (RN14K2E3401D) | 3.40KΩ, ±0.5%, 1/4W | |
| R228 | | Var, MF, (RJ-6P 2KΩ) | 2KΩ, 1/2W | |
| R229 | | Var, MF, (RJ-6P 2KΩ) | 2KΩ, 1/2W | |
| R230 | | MF, (RN14K2E1001D) | 1KΩ, ±0.5%, 1/4W | |
| R231 | | MF, (RM73B2B473JD) | 47KΩ, ±5%, 1/8W | |
| R232 | | MF, (RM73B2B473JD) | 47KΩ, ±5%, 1/8W | |
| R233 | | MF, (RN14K2E1001D) | 1KΩ, ±0.5%, 1/4W | |
| R234 | | MF, (RM73B2B105JD) | 1MΩ, ±5%, 1/8W | |
| R235 | | MF, (RM73B2B102JD) | 1KΩ, ±0.5%, 1/8W | |
| R236 | | MF, (RM73B2B822JD) | 8.2KΩ, ±5%, 1/8W | |
| R237 | | MF, (RM73B2B152JD) | 1.5KΩ, ±5%, 1/8W | |
| R238 | | MF, (RM73B2B123JD) | 12KΩ, ±5%, 1/8W | |
| R239 | | Var, MF, (RJ-6P 2KΩ) | 2KΩ, 1/2W | |
| R240 | | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R241 | | MF, (RM73B2B332JD) | 3.3KΩ, ±5%, 1/8W | |
| R242 | | Var, MF, (RJ-6P 5KΩ) | 5KΩ, 1/2W | |
| R243 | | MF, (RM73B2B272JD) | 2.7KΩ, ±5%, 1/8W | |
| R244 | | Var, MF, (RJ-6P 20KΩ) | 20KΩ, 1/2W | |
| R245 | | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R246 | | MF, (RM73B2B332JD) | 3.3KΩ, ±5%, 1/8W | |
| R247 | | MF, (RM73B2B104JD) | 100KΩ, ±5%, 1/8W | |
| R248 | | Not assigned | | |
| R249 | | MF, (RM73B2B331JD) | 330Ω, ±5%, 1/8W | |
| R250 | | MF, (RM73B2B331JD) | 330Ω, ±5%, 1/8W | |
| R251 | | MF, (RM73B2B180JD) | 18Ω, ±5%, 1/8W | |
| R252 | | CF, (ARD25T103J) | 10KΩ, ±5%, 1/4W | |
| R267 | | | | |
| R268 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R269 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |

44W83350 1/10

4-27

* : Selected at factory

() : Manufacturer's part number

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|----------------------|--------------------|------|
| C 1 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 2 | | Tant, (CS732E1V105M) | 1µF, ±20%, 35V | |
| C 3 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C 4 | | Cer, (CJ733B1H473K) | 0.047µF, ±10%, 50V | |
| C 5 | | to | | |
| C 16 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C 17 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 18 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 19 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 20 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 21 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C 22 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 23 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 24 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C 25 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C 26 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 27 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 28 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 29 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 30 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C 31 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 32 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 33 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 34 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C 35 | | to | | |
| G46 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C47 | | Not assigned | | |
| C48 | | Tant, (CS732E1A475M) | 4.7µF, ±20%, 10V | |
| C49 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C50 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C51 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C52 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C53 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C54 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C55 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C56 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C57 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C58 | | Cer, (CC732CH1H101J) | 100pF, ±5%, 50V | |
| C59 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |
| C60 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C61 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C62 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C63 | | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V | |

44W83350 2/10

4-28

* : Selected at factory

() : Manufacturer's part number

| CRT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|-------------------------|--------------------|------|
| C64 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C65 | | Cer, (CK732BH103K) | 0.01µF, ±10%, 50V | |
| C66 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C67 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C68 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C69 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C70 | | Cer, (CK733BH223K) | 0.022µF, ±10%, 50V | |
| C71 | | Not assigned | | |
| C72 | | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| C73 | | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| C74 | | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| C75 | | Cer, (CC732CH101J) | 100pF, ±5%, 50V | |
| C76 | | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| C77 | | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| C78 | | Cer, (CK732BH102K) | 1000pF, ±10%, 50V | |
| C79 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C80 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C81 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C82 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C83 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C84 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C85 | | Elect, (CE04W1E470) | 47µF, ±20%, 25V | |
| C86 | | Elect, (CE04W1E470) | 47µF, ±20%, 25V | |
| C87 | | Elect, (CE04W1A470) | 47µF, ±20%, 10V | |
| C88 | | Elect, (CE04W1A470) | 47µF, ±20%, 10V | |
| C89 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C90 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C91 | | Not assigned | | |
| C92 | | Not assigned | | |
| C93 | | Cer, (CK732BH103K) | 0.01µF, ±10%, 50V | |
| C94 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C95 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C96 | | Tant, (CS734E0J476M) | 47µF, ±20%, 6.3V | |
| C97 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C98 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C99 | | Tant, (CS732E1A475M) | 47µF, ±20%, 10V | |
| C100 | | Tant, (CS732E1A475M) | 47µF, ±20%, 10V | |
| C101 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C102 | | Tant, (CS732E1A475M) | 47µF, ±20%, 10V | |
| J 1 | | Pattern | | |
| J 2 | | Connector, (HRM100-32S) | | |
| J 3 | | Connector, (HRM100-32S) | | |
| J 4 | | Connector, (HRM100-32S) | | |
| J 5 | | Connector, (HRM100-32S) | | |

44W83350 3/10

() : Manufacturer's part number * : Selected at factory

| CKT REF | DESCRIPTION | RATING | NOTE |
|---------|-----------------------------|--------|------|
| K 1 | Relay, (PGIC-12) | | |
| K 2 | Relay, (PGIC-12) | | |
| K 3 | Relay, (PGIC-12) | | |
| L 1 | Coil, (439T16820) | | |
| L 2 | Coil, (442T38894C) | | |
| L 3 | Coil, (442T56877B) | | |
| L 4 | Coil, (442T56877A) | | |
| L 5 | Coil, (439T16820) | | |
| L 6 | Coil, (442T56877A) | | |
| L 7 | Coil, (442T56877B) | | |
| L 8 | Coil, (442T38894C) | | |
| L 9 | Coil, (439T16820) | | |
| L 10 | Coil, (442T38894C) | | |
| L 11 | Coil, (442T56877B) | | |
| L 12 | Coil, (442T56877A) | | |
| L 13 | Coil, (439T16820) | | |
| L 14 | Coil, (442T56877A) | | |
| L 15 | Coil, (442T68777B) | | |
| L 16 | Coil, (442T38894C) | | |
| Q 1 | Tr, (2SA1154) | | |
| Q 2 | IC, (uPC1251C) | | |
| Q 3 | Tr, (2SA1154) | | |
| Q 4 | Tr, (1S2835) | | |
| Q 5 | FET, (2SK406 (IDSS 50-65)) | | |
| Q 6 | D1, (1S2835) | | |
| Q 7 | IC, (10G021AL (2GHZ)) | | |
| Q 8 | FET, (2SK406 (IDSS 50-65)) | | |
| Q 9 | FET, (2SK406 (IDSS 50-65)) | | |
| Q 10 | IC, (uPC1251C (IDSS 50-65)) | | |
| Q 11 | IC, (uPC1251C) | | |
| Q 12 | FET, (2SK406 (IDSS 50-65)) | | |
| Q 13 | FET, (2SK406 (IDSS 50-65)) | | |
| Q 14 | FET, (2SK406 (IDSS 50-65)) | | |
| Q 15 | FET, (2SK406 (IDSS 50-65)) | | |

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|--|--------|------|
| Q16 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q17 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q18 | | FET, (2SK406 (IDSS 50-65)) | | |
| Q19 | | IC, (HD75451AP) (IDSS 50-65)) | | |
| Q20 | | Not assigned | | |
| Q21 | | FET, (2SK406 (IDSS 65-120)) | | |
| Q22 | | FET, (2SK406 (IDSS 65-120)) | | |
| Q23 | | DI, (1SS123) (IDSS 65-120)) | | |
| Q24 | | FET, (2SK406 (IDSS 65-120)) | | |
| Q25 | | FET, (2SK406 (IDSS 65-120)) | | |
| Q26 | | DI, (1SS123) DI, (1SS123) | | |
| Q27 | | DI, (1SS123) | | |
| Q28 | | IC, (uPC451C) | | |
| Q29 | | IC, (HA2-5033-5) IC, (uPC1251C) | | |
| Q30 | | IC, (uPC1251C) | | |
| Q31 | | Not assigned | | |
| Q32 | | FET, (2SK406 (IDSS 65-120)) | | |
| Q33 | | FET, (2SK406 (IDSS 65-120)) | | |
| Q34 | | DI, (1SS123) FET, (2SK406 (IDSS 65-120)) | | |
| Q35 | | FET, (2SK406 (IDSS 65-120)) | | |
| Q36 | | Tr, (2SA1151) Tr, (2SA1151) | | |
| Q37 | | Tr, (2SA1151) | | |
| Q38 | | IC, (uPC1251C) | | |
| Q39 | | IC, (uPC1251C) | | |
| Q40 | | IC, (HA2-5033-5) | | |
| Q41 | | IC, (uPC1251C) | | |
| Q42 | | IC, (uPC1251C) | | |
| Q43 | | IC, (uPC451C) | | |
| Q44 | | Tr, (2SD882) | | |
| Q45 | | Tr, (2SD882) | | |
| Q46 | | Tr, (2SD882) | | |
| Q47 | | IC, (uPC451C) | | |
| Q48 | | IC, (HI-201-5) | | |
| Q49 | | DI, (1SS123 (A7)) | | |
| Q50 | | DI, (1SS123 (A7)) | | |
| Q51 | | DI, (1SS123 (A7)) | | |
| Q52 | | DI, (1SS123 (A7)) | | |

() : Manufacturer's part number
 * : Selected at factory

44W83350 4/10

44W83350 5/10

* : Selected at factory

() : Manufacturer's part number

| REF | CKT | DESCRIPTION | RATING | NOTE |
|------|--------------------------------|--------------------------------------|--------|-------------|
| R 1 | MF, (RM73B2B182JD) | 1.8K Ω , \pm 5%, 1/8W | | |
| R 2 | MF, (RM73B2B332JD) | 3.3K Ω , \pm 5%, 1/8W | | |
| R 3 | MF, (RM73B2B102JD) | 1K Ω , \pm 5%, 1/8W | | |
| R 4 | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | | |
| R 5 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |
| R 6 | MF, (RM73B2B332JD) | 3.3K Ω , \pm 5%, 1/8W | | |
| R 7 | MF, (RM73B2B102JD) | 1K Ω , \pm 5%, 1/8W | | |
| R 8 | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | | |
| R 9 | MF, (RM73B2B331JD) | 330 Ω , \pm 5%, 1/8W | | |
| R 10 | MF, (RM73B2B470JD) | 47 Ω , \pm 5%, 1/8W | | |
| R 11 | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | | |
| R 12 | Var, MF, (RJ-6P 100 Ω) | 100 Ω , 1/2W | | |
| R 13 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 14 | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | | |
| R 15 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | | |
| R 16 | MF, (RM73B2B * JD) | 100 to 470 Ω , \pm 5%, 1/8W | | Q'ty 1 or * |
| R 17 | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | | |
| R 18 | Not assigned | | | |
| R 19 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 20 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 21 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 22 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | | |
| R 23 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |
| R 24 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 25 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 26 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | | |
| R 27 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |
| R 28 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 29 | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | | |
| R 30 | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | | |
| R 31 | Not assigned | | | |
| R 32 | Not assigned | | | |
| R 33 | Var, MF, (RJ-6P 5K Ω) | 5K Ω , 1/2W | | |
| R 34 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | | |
| R 35 | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | | |
| R 36 | MF, (RM73B2B562JD) | 5.6K Ω , \pm 5%, 1/8W | | |
| R 37 | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | | |
| R 38 | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | | |
| R 39 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |
| R 40 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |
| R 41 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |
| R 42 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |
| R 43 | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | | |

44W83350 6/10

4-32

* : Selected at factory.

() : Manufacturer's part number

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|--|--------|------|
| R44 | | MF, (RM73B2B472JD) 4.7K Ω , \pm 5%, 1/8W | | |
| R45 | | Var, MF, (RJ-6P 5K Ω) 5K Ω , 1/2W | | |
| R46 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R47 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R48 | | MF, (RM73B2B562JD) 5.6K Ω , \pm 5%, 1/8W | | |
| R49 | | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R50 | | MF, (RM73B2B222JD) 2.2K Ω , \pm 5%, 1/8W | | |
| R51 | | MF, (RM73B2B510JD) 51 Ω , \pm 5%, 1/8W | | |
| R52 | | MF, (RM73B2B * JD) 0 to 100 Ω , \pm 5%, 1/8W | | |
| R53 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R54 | | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R55 | | MF, (RM73B2B222JD) 2.2K Ω , \pm 5%, 1/8W | | |
| R56 | | MF, (RM73B2B510JD) 51 Ω , \pm 5%, 1/8W | | |
| R57 | | MF, (RM73B2B * JD) 0 to 100 Ω , \pm 5%, 1/8W | | |
| R58 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R59 | | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R60 | | MF, (RM73B2B222JD) 2.2K Ω , \pm 5%, 1/8W | | |
| R61 | | MF, (RM73B2B510JD) 51 Ω , \pm 5%, 1/8W | | |
| R62 | | MF, (RM73B2B510JD) 51 Ω , \pm 5%, 1/8W | | |
| R63 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R64 | | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R65 | | MF, (RM73B2B222JD) 2.2K Ω , \pm 5%, 1/8W | | |
| R66 | | MF, (RM73B2B510JD) 51 Ω , \pm 5%, 1/8W | | |
| R67 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R68 | | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R69 | | MF, (RM73B2B222JD) 2.2K Ω , \pm 5%, 1/8W | | |
| R70 | | MF, (RM73B2B * JD) 51 to 150 Ω , \pm 5%, 1/8W | | |
| R71 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R72 | | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R73 | | MF, (RM73B2B222JD) 2.2K Ω , \pm 5%, 1/8W | | |
| R74 | | Not assigned | | |
| R75 | | Not assigned | | |
| R76 | | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R77 | | MF, (RM72B2B222JD) 2.2K Ω , \pm 5%, 1/8W | | |
| R78 | | MF, (RM73B2B510JD) 51 Ω , \pm 5%, 1/8W | | |
| R79 | | MF, (RM73B2B * JD) 51 to 100 Ω , \pm 5%, 1/8W | | |
| R80 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |
| R81 | | MF, (RM73B2B510JD) 51 Ω , \pm 5%, 1/8W | | |
| R82 | | MF, (RM73B2B * JD) 0 to 100 Ω , \pm 5%, 1/8W | | |
| R83 | | MF, (RM73B2B103JD) 10K Ω , \pm 5%, 1/8W | | |

1, *
0'ty 1 or

1, *
0'ty 1 or

1, *
0'ty 1 or

1, *
0'ty 1 or

44W83350 7/10

* : Selected at factory

() : Manufacturer's part number

| REF | DESCRIPTION | RATING | NOTE |
|------|---|--------------------------|----------------|
| R84 | MF, (RM73B2B332JD) 3.3KΩ, ±5%, 1/8W | 3.3KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R85 | MF, (RM73B2B332JD) 3.3KΩ, ±5%, 1/8W | 3.3KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R86 | Var, MF, (RJ-6P 500Ω) 500Ω, 1/2W | 500Ω, 1/2W | Q'ty 1 or 1, * |
| R87 | MF, (RM73B2B470JD) 47Ω, ±5%, 1/8W | 47Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R88 | MF, (RM73B2B * JD) 100Ω to 100KΩ, ±5%, 1/8W | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R89 | MF, (RM73B2B * JD) 100Ω to 100KΩ, ±5%, 1/8W | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R90 | Not assigned | | |
| R91 | MF, (RM73B2B * JD) 100Ω to 100KΩ, ±5%, 1/8W | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R92 | MF, (RM73B2B * JD) 51 to 470Ω, ±5%, 1/8W | 51 to 470Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R93 | MF, (RM73B2B * JD) 100Ω to 1KΩ, ±5%, 1/8W | 100Ω to 1KΩ, ±5%, 1/8W | Q'ty 0 or 1, * |
| R94 | MF, (RM73B2B * JD) 100Ω to 100KΩ, ±5%, 1/8W | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R95 | MF, (RM73B2B510JD) 51Ω, ±5%, 1/8W | 51Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R96 | MF, (RM73B2B510JD) 51Ω, ±5%, 1/8W | 51Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R97 | MF, (RM73B2B472JD) 4.7KΩ, ±5%, 1/8W | 4.7KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R98 | MF, (RM73B2B103JD) 10KΩ, ±5%, 1/8W | 10KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R99 | MF, (RM73B2B * JD) 0 to 100Ω, ±5%, 1/8W | 0 to 100Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R100 | MF, (RM73B2B510JD) 51Ω, ±5%, 1/8W | 51Ω, ±5%, 1/8W | |
| R101 | MF, (RM73B2B103JD) 10KΩ, ±5%, 1/8W | 10KΩ, ±5%, 1/8W | |
| R102 | MF, (RM73B2B510JD) 51Ω, ±5%, 1/8W | 51Ω, ±5%, 1/8W | |
| R103 | MF, (RM73B2B472JD) 4.7KΩ, ±5%, 1/8W | 4.7KΩ, ±5%, 1/8W | |
| R104 | MF, (RM73B2B103JD) 10KΩ, ±5%, 1/8W | 10KΩ, ±5%, 1/8W | |
| R105 | MF, (RM73B2B510JD) 51Ω, ±5%, 1/8W | 51Ω, ±5%, 1/8W | |
| R106 | Not assigned | | |
| R107 | MF, (RM73B2B392JD) 3.9KΩ, ±5%, 1/8W | 3.9KΩ, ±5%, 1/8W | |
| R108 | MF, (RM73B2B392JD) 3.9KΩ, ±5%, 1/8W | 3.9KΩ, ±5%, 1/8W | |
| R109 | MF, (RM73B2B392JD) 3.9KΩ, ±5%, 1/8W | 3.9KΩ, ±5%, 1/8W | |
| R110 | MF, (RM73B2B392JD) 3.9KΩ, ±5%, 1/8W | 3.9KΩ, ±5%, 1/8W | |
| R111 | Var, MF, (RJ-6P 5KΩ) 5KΩ, 1/2W | 5KΩ, 1/2W | |
| R112 | MF, (RM73B2B332JD) 3.3KΩ, ±5%, 1/8W | 3.3KΩ, ±5%, 1/8W | |
| R113 | MF, (RM73B2B562JD) 5.6KΩ, ±5%, 1/8W | 5.6KΩ, ±5%, 1/8W | |
| R114 | Var, MF, (RJ-6P 1KΩ) 1KΩ, 1/2W | 1KΩ, 1/2W | |
| R115 | MF, (RM73B2B332JD) 3.3KΩ, ±5%, 1/8W | 3.3KΩ, ±5%, 1/8W | |
| R116 | MF, (RM73B2B103JD) 10KΩ, ±5%, 1/8W | 10KΩ, ±5%, 1/8W | |
| R117 | MF, (RM73B2B103JD) 10KΩ, ±5%, 1/8W | 10KΩ, ±5%, 1/8W | |
| R118 | MF, (RM73B2B103JD) 10KΩ, ±5%, 1/8W | 10KΩ, ±5%, 1/8W | |
| R119 | MF, (RM73B2B103JD) 10KΩ, ±5%, 1/8W | 10KΩ, ±5%, 1/8W | |
| R120 | MF, (RM73B2B472JD) 4.7KΩ, ±5%, 1/8W | 4.7KΩ, ±5%, 1/8W | |

44W83350 8/10

4-34

* : Selected at factory

() : Manufacturer's part number

| REF | DESCRIPTION | RATING | NOTE |
|------|-----------------------|--------------------------|----------------|
| R121 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R122 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R123 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R124 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R125 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R126 | Var, MF, (RJ-6P 5KΩ) | 5KΩ, 1/2W | |
| R127 | MF, (RM73B2B332JD) | 3.3KΩ, ±5%, 1/8W | |
| R128 | MF, (RM73B2B682JD) | 6.8KΩ, ±5%, 1/8W | |
| R129 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R130 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R131 | Not assigned | | |
| R132 | Not assigned | | |
| R133 | Var, MF, (RJ-6P 500Ω) | 500Ω, 1/2W | |
| R134 | MF, (RM73B2B470JD) | 47Ω, 5%, 1/8W | |
| R135 | MF, (RM73B2B * JD) | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R136 | MF, (RM73B2B * JD) | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R137 | MF, (RM73B2B * JD) | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R138 | MF, (RM73B2B * JD) | 51 to 470Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R139 | MF, (RM73B2B * JD) | 100Ω to 1KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R140 | MF, (RM73B2B * JD) | 100Ω to 100KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R141 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R142 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R143 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R144 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R145 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R146 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R147 | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R148 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R149 | MF, (RM73B2B392JD) | 3.9KΩ, ±5%, 1/8W | |
| R150 | MF, (RM73B2B392JD) | 3.9KΩ, ±5%, 1/8W | |
| R151 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R152 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R153 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R154 | MF, (RM73B2B332JD) | 3.3KΩ, ±5%, 1/8W | |
| R155 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R156 | MF, (RM73B2B101JD) | 100Ω, ±5%, 1/8W | |
| R157 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R158 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R159 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R160 | MF, (RM73B2B471JD) | 470Ω, ±5%, 1/8W | |

44W83350 9/10 4-35

() : Manufacturer's part number * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|--------------------------------|--------------------------------|------|
| R161 | | Not assigned | | |
| R162 | | Not assigned | | |
| R163 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R164 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R165 | | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | |
| R166 | | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | |
| R167 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R168 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R169 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R170 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R171 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R172 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R173 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R174 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R175 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R176 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , \pm 1/2W | |
| R177 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , \pm 1/2W | |
| R178 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R179 | | Var, MF, (RJ-6P 2K Ω) | 2K Ω , 1/2W | |
| R180 | | Var, MF, (RJ-6P 2K Ω) | 2K Ω , 1/2W | |
| R181 | | MF, (RM73B2B472JD) | 4.7K Ω , 5%, 1/8W | |
| R182 | | MF, (RM73B2B153JD) | 15K Ω , \pm 5%, 1/8W | |
| R183 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R184 | | Var, MF, (RJ-6P 10K Ω) | 10K Ω , 1/2W | |
| R185 | | MF, (RM73B2B222JD) | 22K Ω , \pm 5%, 1/8W | |
| R186 | | MF, (RM73B2B222JD) | 22K Ω , \pm 5%, 1/8W | |
| R187 | | Var, MF, (RJ-6P 10K Ω) | 10K Ω , 1/2W | |
| R188 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R189 | | MF, (RM73B2B153JD) | 15K Ω , \pm 5%, 1/8W | |
| R190 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R191 | | Not assigned | | |
| R192 | | Not assigned | | |
| R193 | | MF, (RM73B2B822JD) | 8.2K Ω , \pm 5%, 1/8W | |
| R194 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R195 | | MF, (RM73B2B822JD) | 8.2K Ω , \pm 5%, 1/8W | |
| R196 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R197 | | Var, MF, (RJ-6P 5K Ω) | 5K Ω , 1/2W | |
| R198 | | MF, (RM73B2B822JD) | 8.2K Ω , \pm 5%, 1/8W | |
| R199 | | MF, (RM73B2B562JD) | 5.6K Ω , \pm 5%, 1/8W | |
| R200 | | Var, MF, (RJ-6P 10K Ω) | 10K Ω , 1/2W | |
| R201 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R202 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R203 | | Var, MF, (RJ-6P 2K Ω) | 2K Ω , 1/2W | |
| R204 | | Var, MF, (RJ-6P 2K Ω) | 2K Ω , 1/2W | |
| R205 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |

44W83350 10/10

4-36

() : Manufacturer's part number * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|--------------------------------|--------------------------------|------|
| R206 | | MF, (RM73B2B22JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R207 | | Var, MF, (RJ-6P 10K Ω) | 10K Ω , 1/2W | |
| R208 | | MF, (RM73B2B562JD) | 5.6K Ω , \pm 5%, 1/8W | |
| R209 | | MF, (RM73B2B822JD) | 8.2K Ω , \pm 5%, 1/8W | |
| R210 | | Var, MF, (RJ-6P 5K Ω) | 5K Ω , 1/2W | |
| R211 | | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | |
| R212 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R213 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R214 | | MF, (RM73B2B682JD) | 6.8K Ω , \pm 5%, 1/8W | |
| R215 | | MF, (RM73B2B273JD) | 27K Ω , \pm 5%, 1/8W | |
| R216 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R217 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R218 | | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | |
| R219 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R220 | | MF, (RM73B2B273JD) | 27K Ω , \pm 5%, 1/8W | |
| R221 | | MF, (RM73B2B471JD) | 470 Ω , \pm 5%, 1/8W | |
| R222 | | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | |
| R223 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R224 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R225 | | MF, (RM73B2B123JD) | 12K Ω , \pm 5%, 1/8W | |
| R226 | | MF, (RM73B2B273JD) | 27K Ω , \pm 5%, 1/8W | |

44W83355 1/1

() : Manufacturer's part number
 * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|------|-----------------------------|--------|------|
| | J 1 | Cable, (CNF23-34D-AA40S) | | |
| | Q 1 | IC, (LN513GA) | | |
| | Q 2 | IC, (LN513GA) | | |
| | Q 3 | IC, (LN513GA) | | |
| | Q 4 | IC, (LN513GA) | | |
| | Q 5 | IC, (LN513GA) | | |
| | Q 6 | IC, (LN342GPH) | | |
| | Q 7 | IC, (LN342GPH) | | |
| | Q 8 | IC, (LN342GPH) | | |
| | Q 9 | IC, (LN342GPH) | | |
| | Q 10 | IC, (LN342GPH) | | |
| | S 1 | Switch, (KEG10901) | | |
| | S 2 | Switch, (KEG10901) | | |
| | S 3 | Switch, (KEG10901) | | |
| | S 4 | Switch, (KEG10901) | | |
| | S 5 | Switch, (KEG10901) | | |
| | S 6 | Toggle, (HL-20NS) | | |
| | S 7 | Switch, (HL-20LSYG) | | |
| | S 8 | Toggle, (HL-20NS) | | |

44W83046 1/1

4-38

* : Selected at factory

() : Manufacturer's part number

| CR1 | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|-------------------------------------|----------------------|------|
| C 1 | | Elect, (CE02CIA470) | 47µF, ±20%, 10V | |
| C 2 | | Cer, (CK924FIH104Z) | 0.1µF, +80/-20%, 50V | |
| C 3 | | Cer, (CK924FIH104Z) | 0.1µF, +80/-20%, 50V | |
| C 4 | | Cer, (CK924FIH104Z) | 0.1µF, +80/-20%, 50V | |
| C 5 | | Cer, (CK924FIH104Z) | 0.1µF, +80/-20%, 50V | |
| C 6 | | Cer, (CK924FIH104Z) | 0.1µF, +80/-20%, 50V | |
| C 7 | | Cer, (CK924FIH104Z) | 0.1µF, +80/-20%, 50V | |
| C 8 | | Cer, (CK924FIH104Z) | 0.1µF, +80/-20%, 50V | |
| J 1 | | Pattern | | |
| J 2 | | Connector, (57LB-20240-27CO-D35H) | | |
| Q 1 | | IC, (75160A) | | |
| Q 2 | | IC, (75162A) | | |
| Q 3 | | IC, (µPD7210C) | | |
| Q 4 | | IC, (74LS00) | | |
| Q 5 | | IC, (74LS367A) | | |
| Q 6 | | IC, (74LS240) | | |
| Q 7 | | IC, (74LS74A) | | |
| Q 8 | | IC, (74LS32) | | |
| Q 9 | | IC, (74LS139) | | |
| R 1 | | Single in-line array, (IHR-8-103JA) | 10KΩ x 8, 1/8W | |
| S 1 | | Dip, (BP-8) | | |

44W83047 1/1

() : Manufacturer's part number * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|-------------------------------------|----------------------|------|
| C 1 | | Elect, (CE02C1A470) | 47µF, ±20%, 10V | |
| C 2 | | Elect, (CE02C1C330) | 33µF, ±20%, 16V | |
| C 3 | | Elect, (CE02C1C330) | 33µF, ±20%, 16V | |
| C 4 | | Cer, (CC924CH1H151J) | 150PF, ±5%, 50V | |
| C 5 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 6 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 7 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 8 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 9 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 10 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 11 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 12 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| C 13 | | Cer, (CK924F1H104Z) | 0.1µF, +80/-20%, 50V | |
| J 1 | | Pattern Connector, (DB-25SA-J4) | | |
| Q 1 | | IC, (SN75189AN) | | |
| Q 2 | | IC, (74LS240) | | |
| Q 3 | | IC, (SN75188N) | | |
| Q 4 | | IC, (µPD8251AFC) | | |
| Q 5 | | IC, (74LS04) | | |
| Q 6 | | IC, (74LS367A) | | |
| Q 7 | | IC, (COM8146) | | |
| Q 8 | | IC, (74LS139) | | |
| R 1 | | Single in-line array, (IHR-8-103JA) | 10KΩ x 8, 1/8W | |
| R 2 | | Single in-line array, (IHR-4-103JA) | 10KΩ x 4, 1/8W | |
| S 1 | | Dip, (S-2031) | | |
| S 2 | | Dip, (B-8A) | | |
| X 1 | | XTAL OSC, (NX-5068) | 5.0688MHZ | |

() : Manufacturer's part number

* : Selected at factory

4-40

44W83356 1/1

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|---------------------------------|--------|----------|
| G 1 | | Fan, (FBB-06B-12L) | | |
| J 1 | | Connector, (PI011-03F) | | |
| J 2 | | Connector, (HIF3BA5B-34D-AA46S) | | |
| J 3 | | Connector, (NM11-2F) | | |
| J 4 | | Connector, (NM11-2F) | | |
| J 5 | | Connector, (NM11-2F) | | |
| J 6 | | Connector, (NM11-2F) | | |
| J 7 | | Not assigned | | |
| J 8 | | Not assigned | | |
| J 9 | | Connector, (HRM-208B) | | |
| J 10 | | Not assigned | | |
| J 11 | | Connector, (HRM-208B) | | |
| J 12 | | Connector, (NM27-2F) | | |
| J 13 | | Connector, (NM27-2F) | | |
| J 14 | | Connector, (HRM556S) | | |
| J 15 | | Connector, (HRM556S) | | |
| J 16 | | Connector, (BNC-PJ2-NI) | | |
| J 17 | | Not assigned | | |
| J 18 | | Connector, (BNC-PJ2-NI) | | |
| Z 1 | | DEMUX | | 44W83357 |
| Z 2 | | CLOCK DELAY | | 44W83358 |
| Z 3 | | CONTROL | | 44W83352 |
| Z 4 | | POWER SUPPLY | | 44W83353 |
| Z 5 | | MOTHER BOARD | | 44W83354 |
| Z 6 | | DISPLAY | | 44W83355 |
| Z 7 | | Not assigned | | |
| Z 8 | | Not assigned | | |
| Z 9 | | Not assigned | | |
| Z 10 | | Not assigned | | |
| Z 11 | | Not assigned | | |
| Z 12 | | Not assigned | | |
| Z 13 | | GP-IB | | 44W83046 |
| Z 14 | | RS-232C | | 44W83047 |

44W83358 1/6 4-41

() : Manufacturer's part number
 * : Selected at factory

| CRT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|---------------------|--------------------|------|
| C 1 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 2 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 3 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 4 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 5 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 6 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 7 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C 8 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C 9 | | to | 0.047µF, ±10%, 50V | |
| C23 | | to | 0.047µF, ±10%, 50V | |
| C24 | | Not assigned | | |
| C25 | | Not assigned | | |
| C26 | | to | 0.047µF, ±10%, 50V | |
| C36 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C37 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C38 | | to | 0.047µF, ±10%, 50V | |
| C53 | | Not assigned | | |
| C54 | | Not assigned | | |
| C55 | | Not assigned | | |
| C56 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C57 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C58 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C59 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C60 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C61 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C62 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C63 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C64 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C65 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C66 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C67 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C68 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C69 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C70 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C71 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C72 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C73 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C74 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C75 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C76 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C77 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |
| C78 | | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V | |
| C79 | | Cer, (CK732B1H102K) | 1000pF, ±10%, 50V | |

44W83358 2/6

() : Manufacturer's part number
 * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|--------------------------|-------------------------------|------|
| C80 | | Tant, (CS734E1V475M) | 4.7 μ F, \pm 20%, 35V | |
| C81 | | Elect, (CE04W1E470) | 47 μ F, \pm 20%, 25V | |
| C82 | | Elect, (CE04W1E470) | 47 μ F, \pm 20%, 25V | |
| C83 | | Elect, (CE04W1A470) | 47 μ F, \pm 20%, 10V | |
| C84 | | Elect, (CE04W1A470) | 47 μ F, \pm 20%, 10V | |
| C85 | | Not assigned | | |
| C86 | | Not assigned | | |
| C87 | | Cer, (CK733B1H473K) | 0.047 μ F, \pm 10%, 50V | |
| C88 | | Cer, (CK733B1H473K) | 0.047 μ F, \pm 10%, 50V | |
| C89 | | Tant, (CS732E1A475M) | 4.7 μ F, \pm 20%, 10V | |
| C90 | | Cer, (CK733B1H473K) | 0.047 μ F, \pm 20%, 50V | |
| C91 | | Tant, (CS732E1A475M) | 4.7 μ F, \pm 20%, 10V | |
| J 1 | | Pattern | | |
| J 2 | | Connector, (HRM100-32S) | | |
| J 3 | | Connector, (HRM100-32S) | | |
| M 1 | | Timer, (TM-O) | | |
| Q 1 | | D1, breakdown, (RD2.7MB) | 2.5 to 2.9V, 200mW | |
| Q 2 | | IC, (ND587T-3B) | | |
| Q 3 | | D1, (1S2837) | | |
| Q 4 | | Tr, (2SK406) | | |
| Q 5 | | IC, (ND587T-3B) | | |
| Q 6 | | Tr, (2SK406) | | |
| Q 7 | | IC, (PPB581C) | | |
| Q 8 | | IC, (μ PA102G) | | |
| Q 9 | | IC, (μ PA102G) | | |
| Q 10 | | Not assigned | | |
| Q 11 | | Not assigned | | |
| Q 12 | | Tr, (2SK406) | | |
| Q 13 | | D1, breakdown, (RD2.7MB) | 2.5 to 2.9V, 200mW | |
| Q 14 | | Tr, (2SK406) | | |
| Q 28 | | Tr, (2SK406) | | |

44W83358 3/6

* : Selected at factory

() : Manufacturer's part number

| CRT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|----------------------|----------------------|------|
| Q29 | | Not assigned | | |
| Q30 | | Not assigned | | |
| Q31 | | IC, (uPC1251C) | | |
| Q32 | | Tr, (2SA1154) | | |
| Q33 | | IC, (uPC177C) | | |
| Q34 | | IC, (uPC177C) | | |
| Q35 | | IC, (uPC177C) | | |
| Q36 | | IC, (uPC177C) | | |
| Q37 | | IC, (74LS154) | | |
| Q38 | | IC, (74LS30) | | |
| Q39 | | IC, (74LS30) | | |
| Q40 | | IC, (74LS04) | | |
| Q41 | | Tr, (2SD882) | | |
| Q42 | | Tr, (2SD882) | | |
| Q43 | | IC, (uPC1251C) | | |
| R1 | | MF, (NRTF1/4C1000J) | 100Ω, ±5%, 1/4W | |
| R2 | | MF, (NRTF1/4C1000J) | 100Ω, ±5%, 1/4W | |
| R3 | | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R4 | | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R5 | | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | |
| R6 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R7 | | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R8 | | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R9 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R10 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R11 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R12 | | MF, (RM73B2B101JD) | 100Ω, ±5%, 1/8W | |
| R13 | | MF, (RM73B2B105JD) | 1MΩ, ±5%, 1/8W | |
| R14 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R15 | | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R16 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R17 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R18 | | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | |
| R19 | | MF, (RM73B2B121JD) | 120Ω, ±5%, 1/8W | |
| R20 | | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | |
| R21 | | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | |
| R22 | | MF, (RM73B2B272JD) | 2.7KΩ, ±5%, 1/8W | |
| R23 | | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R24 | | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R25 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R26 | | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | |
| R27 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R28 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R29 | | MF, (RM73B2B390JD) | 39Ω, ±5%, 1/8W | |
| R30 | | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | |

Q'ty 1 or 1, *

Q'ty 1 or 1, *

NOTE

44W83358 4/6

4-44

() : Manufacturer's part number * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|--------------------------------|--------------------------------------|----------------|
| R31 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R32 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R33 | | MF, (RM73B2B471JD) | 470 Ω , $\pm 5\%$, 1/8W | |
| R34 | | MF, (RM73B2B681JD) | 680 Ω , $\pm 5\%$, 1/8W | |
| R35 | | MF, (RM73B2B101JD) | 100 Ω , $\pm 5\%$, 1/8W | |
| R36 | | MF, (RM63B2B330JD) | 33 Ω , $\pm 5\%$, 1/8W | |
| R37 | | Not assigned | | |
| R38 | | Not assigned | | |
| R39 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R40 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R41 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R42 | | MF, (RM73B2B103JD) | 10K Ω , $\pm 5\%$, 1/8W | |
| R43 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R44 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R45 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R46 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R47 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R48 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R49 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R50 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R51 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R52 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R53 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R54 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R55 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R56 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R57 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R58 | | MF, (RM73B2B102JD) | 1K Ω , $\pm 5\%$, 1/8W | |
| R59 | | MF, (RM73B2B * JD) | 0 to 100 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R60 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R61 | | Var, MF, (RJ-6P 500 Ω) | 500 Ω , 1/2W | |
| R62 | | Var, MF, (RJ-6P 500 Ω) | 500 Ω , 1/2W | |
| R63 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R64 | | MF, (RM73B2B * JD) | 0 to 100 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R65 | | MF, (RM73B2B * JD) | 0 to 100 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R66 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R67 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R68 | | MF, (RM73B2B510JD) | 51 Ω , $\pm 5\%$, 1/8W | |
| R69 | | MF, (RM73B2B560JD) | 56 Ω , $\pm 5\%$, 1/8W | |
| R70 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R71 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R72 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R73 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |
| R74 | | MF, (RM73B2B * JD) | 0 to 220 Ω , $\pm 5\%$, 1/8W | Q'ty 1 or 1, * |
| R75 | | MF, (RM73B2B472JD) | 4.7K Ω , $\pm 5\%$, 1/8W | |

44W83358 5/6

4-45

* : Selected at factory

() : Manufacturer's part number

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|-------------------------------------|----------------------|------|
| R76 | | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | |
| R77 | | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R78 | | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | |
| R79 | | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R80 | | MF, (RM73B2B560JD) | 56Ω, ±5%, 1/8W | |
| R81 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R82 | | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R83 | | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R84 | | MF, (RM73B2B * JD) | 0 to 220Ω, ±5%, 1/8W | |
| R85 | | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R86 | | Var, MF, (RJ-6P 1kΩ) | 1kΩ, 1/2W | |
| R87 | | Not assigned | | |
| R88 | | Not assigned | | |
| R89 | | | | |
| to | | Var, MF, (RJ-6P 500Ω) | 500Ω, 1/2W | |
| R99 | | | | |
| R100 | | Var, MF, (RJ-6P 2kΩ) | 2kΩ, 1/2W | |
| R101 | | MF, (RM73B2B222JD) | 2.2kΩ, ±5%, 1/8W | |
| R102 | | MF, (RM73B2B222JD) | 2.2kΩ, ±5%, 1/8W | |
| R103 | | MF, (RM73B2B222JD) | 2.2kΩ, ±5%, 1/8W | |
| R104 | | MF, (RM73B2B101JD) | 100Ω, ±5%, 1/8W | |
| R105 | | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R106 | | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R107 | | MF, (RM73B2B222JD) | 2.2kΩ, ±5%, 1/8W | |
| R108 | | MF, (RM73B2B822JD) | 8.2kΩ, ±5%, 1/8W | |
| R109 | | | | |
| to | | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R119 | | | | |
| R120 | | MF, (RM73B2B562JD) | 5.6kΩ, ±5%, 1/8W | |
| R121 | | Var, MF, (RJ-6P 1kΩ) | 1kΩ, 1/2W | |
| R122 | | Not assigned | | |
| R123 | | Not assigned | | |
| R124 | | MF, (RM73B2B822JD) | 8.2kΩ, ±5%, 1/8W | |
| R125 | | MF, (RM73B2B102JD) | 1kΩ, ±5%, 1/8W | |
| R126 | | MF, (RM73B2B105JD) | 1MΩ, ±5%, 1/8W | |
| R127 | | Single in-line array, (IHR-7-152JB) | 1.5kΩ x 7, 1/8W | |
| R128 | | Single in-line array, (IHR-7-152JB) | 1.5kΩ x 7, 1/8W | |
| R129 | | Single in-line array, (IHR-7-152JB) | 3.3kΩ x 7, 1/8W | |
| R130 | | Single in-line array, (IHR-7-332JA) | 3.3kΩ, x 7, 1/8W | |
| R131 | | MF, (RM73B2B273JD) | 27kΩ, ±5%, 1/8W | |
| R132 | | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |

* or 1, 1 or 1, *

* or 1, 1 or 1, *

44W83358 6/6 4-46

() : Manufacturer's part number
 * : Selected at factory

| CKT REF | DESCRIPTION | RATING | NOTE |
|---------|--------------------|------------------|------|
| R133 | MF, (RM73B2B103JD) | 100Ω, ±5%, 1/8W | |
| R134 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R135 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R136 | MF, (RM73B2B273JD) | 27KΩ, ±5%, 1/8W | |
| R137 | MF, (RM73B2B682JD) | 6.8KΩ, ±5%, 1/8W | |
| R138 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R139 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R140 | MF, (RM73B2B101JD) | 100Ω, ±5%, 1/8W | |

CKT REF

DESCRIPTION

RATING

NOTE

| | | |
|-----|---------------------|--------------------|
| C1 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C2 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C3 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C4 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C5 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C6 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C7 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C8 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C9 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C10 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C11 | Not assigned | |
| C12 | Not assigned | |
| C13 | Not assigned | |
| C14 | | |
| C24 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C25 | Not assigned | |
| C26 | Not assigned | |
| C27 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C28 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C29 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C30 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C31 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C32 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C33 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C34 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C35 | Not assigned | |
| C36 | Not assigned | |
| C37 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C38 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C39 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C40 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C41 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C42 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C43 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C44 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C45 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C46 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C47 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C48 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C49 | Cer, (CK732B1H103K) | 0.01µF, ±10%, 50V |
| C50 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C51 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C52 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C53 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |
| C54 | Cer, (CK733B1H473K) | 0.047µF, ±10%, 50V |

() : Manufacturer's part number
 * : Selected at factory

44W83357 1/9

4-47

Parts List : Z1 DEMUX

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|-------------------------|--------------------|------|
| C55 | | Not assigned | | |
| C56 | | Not assigned | | |
| C57 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C58 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C59 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C60 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C61 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C62 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C63 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C64 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C65 | | Cer, (CK732BH103K) | 0.01µF, ±10%, 50V | |
| C75 | | | | |
| C76 | | Not assigned | | |
| C77 | | Not assigned | | |
| C78 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C79 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C80 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C81 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C82 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C83 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C84 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C85 | | Elect, (CE04W1E470) | 47µF, ±20%, 25V | |
| C86 | | Elect, (CE04W1E470) | 47µF, ±20%, 25V | |
| C87 | | Elect, (CE04W1A470) | 47µF, ±20%, 10V | |
| C88 | | Elect, (CE04W1A470) | 47µF, ±20%, 10V | |
| C89 | | Tant, (CS732E1V105M) | 1µF, ±20%, 35V | |
| C90 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C91 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C92 | | Tant, (CS732E1V105M) | 1µF, ±20%, 35V | |
| C93 | | Not assigned | | |
| C94 | | Not assigned | | |
| C95 | | Not assigned | | |
| C96 | | | | |
| C110 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C111 | | Not assigned | | |
| C112 | | Not assigned | | |
| C113 | | Tant, (CS732E1V105M) | 1µF, ±20%, 35V | |
| C114 | | Cer, (CK733BH473K) | 0.047µF, ±10%, 50V | |
| C115 | | Cer, (CK732BH103K) | 0.01µF, ±10%, 50V | |
| J 1 | | Pattern | | |
| J 2 | | Connector, (HRM100-32S) | | |
| J 3 | | Not assigned | | |

() : Manufacturer's part number

* : Selected at factory

44W83357 2/9

44W83357 3/9

4-49

() : Manufacturer's part number
 * : Selected at factory

| REF | DESCRIPTION | RATING | NOTE |
|------|---------------------------|--------------------|------|
| J 4 | Connector, (HRM100-32S) | | |
| J 5 | Connector, (HRM100-32S) | | |
| J 6 | Connector, (HRM100-32S) | | |
| K 1 | Relay, (RA30201121) | | |
| K 2 | Relay, (RA30201121) | | |
| K 3 | Relay, (712-12) | | |
| L 1 | Coil, (442T56877) | | |
| Q 1 | IC, (uPC1251C) | | |
| Q 2 | IC, (uPC451C) | | |
| Q 3 | IC, (uPC1251C) | | |
| Q 4 | DI, (1S2837) | | |
| Q 5 | Tr, (2SC3584) | | |
| Q 6 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 7 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 8 | IC, (ND587T-3B) | | |
| Q 9 | DI, breakdown, (RD2.7MB) | 2.5 to 2.9V, 200mW | |
| Q 10 | D, (1S2835) | | |
| Q 11 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 12 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 13 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 14 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 15 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 16 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 17 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q 18 | IC, (uPC1251C) | | |
| Q 19 | IC, (uPC1251C) | | |
| Q 20 | IC, (uPC1251C) | | |
| Q 21 | IC, (uPC451C) | | |
| Q 22 | DI, (1S953) | | |
| Q 23 | IC, (HD75451AP) | | |
| Q 24 | Not assigned | | |
| Q 25 | Not assigned | | |
| Q 26 | DI, (1S953) | | |
| Q 27 | DI, (1S2835) | | |
| Q 28 | IC, (uPA102G) | | |
| Q 29 | DI, (1S2835) | | |
| Q 30 | IC, (uPA102G) | | |
| Q 31 | IC, (10G021AL (2GHZ)) | | |
| Q 32 | Tr, (2SK406 (IDSS 50-65)) | | |

44W83357 4/9

* : Selected at factory

() : Manufacturer's part number

| REF | DESCRIPTION | RATING | NOTE |
|------|---------------------------|------------------|------|
| Q33 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q34 | IC, (μPC451C) | | |
| Q35 | D1, (1S2835) | | |
| Q36 | Tr, (2SA1154) | | |
| Q37 | Tr, (2SA1154) | | |
| Q38 | IC, (μPC1251C) | | |
| Q39 | Not assigned | | |
| Q40 | Not assigned | | |
| Q41 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q42 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q43 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q44 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q45 | Tr, (2SK406 (IDSS 50-65)) | | |
| Q46 | IC, (μPC1251C) | | |
| Q47 | Tr, (2SA1154) | | |
| R 1 | MF, (RM73B2B562JD) | 5.6kΩ, ±5%, 1/8W | |
| R 2 | Var, MF, (RJ-6P 5kΩ) | 5kΩ, 1/2W | |
| R 3 | Var, MF, (RJ-6P 1kΩ) | 1kΩ, 1/2W | |
| R 4 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 5 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 6 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R 7 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R 8 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 9 | MF, (RM73B2B682JD) | 6.8kΩ, ±5%, 1/8W | |
| R 10 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R 11 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 12 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 13 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 14 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R 15 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R 16 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 17 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 18 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |
| R 19 | MF, (RM73B2B472JD) | 4.7kΩ, ±5%, 1/8W | |
| R 20 | MF, (RM73B2B562JD) | 5.6kΩ, ±5%, 1/8W | |
| R 21 | Var, MF, (RJ-6P 1kΩ) | 1kΩ, 1/2W | |
| R 22 | Var, MF, (RJ-6P 5kΩ) | 5kΩ, 1/2W | |
| R 23 | Var, MF, (RJ-6P 1kΩ) | 1kΩ, 1/2W | |
| R 24 | Var, MF, (RJ-6P 5kΩ) | 5kΩ, 1/2W | |
| R 25 | Var, MF, (RJ-6P 5kΩ) | 5kΩ, 1/2W | |
| R 26 | Var, MF, (RJ-6P 1kΩ) | 1kΩ, 1/2W | |
| R 27 | MF, (RM73B2B562JD) | 5.6kΩ, ±5%, 1/8W | |
| R 28 | MF, (RM73B2B103JD) | 10kΩ, ±5%, 1/8W | |

4-51
44W83357 5/9

() : Manufacturer's part number
* : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|-----|-----|-------------------------------|------------------------------------|----------------|
| R29 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R30 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R31 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R32 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R33 | | MF, (RM73B2B332JD) | 3.3K Ω , \pm 5%, 1/8W | |
| R34 | | Var, MF, (RJ-6P 2K Ω) | 2K Ω , 1/2W | |
| R35 | | Not assigned | | |
| R36 | | Not assigned | | |
| R37 | | Not assigned | | |
| R38 | | MF, (RM73B2B331JD) | 330 Ω , \pm 5%, 1/8W | |
| R39 | | MF, (RM73B2B820JD) | 82 Ω , \pm 5%, 1/8W | |
| R40 | | MF, (RM73B2B * JD) | 0 to 220 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R41 | | Var, MF, (RJ-6P 1K Ω) | 1K Ω , 1/2W | |
| R42 | | MF, (RM73B2B * JD) | 0 to 220 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R43 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R44 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R45 | | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R46 | | MF, (NRTF1/4C100 Ω J) | 100 Ω , \pm 5%, 1/4W | |
| R47 | | MF, (NRTF1/4C100 Ω J) | 100 Ω , \pm 5%, 1/4W | |
| R48 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R49 | | MF, (RM73B2B222JD) | 2.2K Ω , \pm 5%, 1/8W | |
| R50 | | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R51 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R52 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R53 | | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R54 | | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R55 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R56 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R57 | | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R58 | | MF, (RM73B2B101JD) | 100 Ω , \pm 5%, 1/8W | |
| R59 | | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R60 | | Not assigned | | |
| R61 | | Not assigned | | |
| R62 | | Not assigned | | |
| R63 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R64 | | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R65 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R66 | | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R67 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R68 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R69 | | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |
| R70 | | MF, (RM73B2B510JD) | 51 Ω , \pm 5%, 1/8W | |
| R71 | | MF, (RM73B2B103JD) | 10K Ω , \pm 5%, 1/8W | |
| R72 | | MF, (RM73B2B472JD) | 4.7K Ω , \pm 5%, 1/8W | |
| R73 | | MF, (RM73B2B * JD) | 0 to 100 Ω , \pm 5%, 1/8W | Q'ty 1 or 1, * |

| REF | DESCRIPTION | RATING | NOTE |
|------|----------------------|----------------------|---------------|
| R74 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Qty 1 or 1, * |
| R75 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R76 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R77 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R78 | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Qty 1 or 1, * |
| R79 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R80 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R81 | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R82 | Not assigned | | |
| R83 | Not assigned | | |
| R84 | Not assigned | | |
| R85 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R86 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R87 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R88 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R89 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R90 | MF, (RM73B2B562JD) | 5.6KΩ, ±5%, 1/8W | |
| R91 | Var, MF, (RJ-6P 5KΩ) | 5KΩ, 1/2W | |
| R92 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R93 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R94 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R95 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R96 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R97 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R98 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R99 | Var, MF, (RJ-6P 5KΩ) | 5KΩ, 1/2W | |
| R100 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R101 | Not assigned | | |
| R102 | Not assigned | | |
| R103 | Not assigned | | |
| R104 | Var, MF, (RJ-6P 5KΩ) | 5KΩ, 1/2W | |
| R105 | Var, MF, (RJ-6P 1KΩ) | 1KΩ, 1/2W | |
| R106 | MF, (RM73B2B562JD) | 5.6KΩ, ±5%, 1/8W | |
| R107 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R108 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R109 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R110 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R111 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R112 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R113 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R114 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R115 | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R116 | MF, (RM73B2B472JD) | 4.7KΩ, ±5%, 1/8W | |
| R117 | MF, (RM73B2B562JD) | 5.6KΩ, ±5%, 1/8W | |
| R118 | Var, MF, (RJ-6P 5KΩ) | 5KΩ, 1/2W | |

() : Manufacturer's part number * : Selected at factory

44W83357 6/9

CKT
REF

DESCRIPTION

RATING

NOTE

| | | | |
|------|--|--|--|
| R119 | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R120 | Var, MF, (RJ-6P 5K Ω) 5K Ω , 1/2W | | |
| R121 | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R122 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R123 | MF, (RM73B2B103JD) 10K Ω , $\pm 5\%$, 1/8W | | |
| R124 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R125 | MF, (RM73B2B103JD) 10K Ω , $\pm 5\%$, 1/8W | | |
| R126 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R127 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R128 | MF, (RM73B2B103JD) 10K Ω , $\pm 5\%$, 1/8W | | |
| R129 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R130 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R131 | MF, (RM73B2B103JD) 10K Ω , $\pm 5\%$, 1/8W | | |
| R132 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R133 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R134 | Var, MF, (RJ-6P 5K Ω) 5K Ω , 1/2W | | |
| R135 | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R136 | Not assigned | | |
| R137 | Not assigned | | |
| R138 | Not assigned | | |
| R139 | MF, (RM73B2B103JD) 10K Ω , $\pm 5\%$, 1/8W | | |
| R140 | MF, (RM73B2B103JD) 10K Ω , $\pm 5\%$, 1/8W | | |
| R141 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R142 | MF, (RM73B2B103JD) 10K Ω , $\pm 5\%$, 1/8W | | |
| R143 | MF, (RM73B2B472JD) 4.7K Ω , $\pm 5\%$, 1/8W | | |
| R144 | Var, MF, (RJ-6P 5K Ω) 5K Ω , 1/2W | | |
| R145 | Var, MF, (RJ-6P 5K Ω) 5K Ω , 1/2W | | |
| R146 | MF, (RM73B2B222JD) 2.2K Ω , $\pm 5\%$, 1/8W | | |
| R147 | MF, (RM73B2B151JD) 150 Ω , $\pm 5\%$, 1/8W | | |
| R148 | MF, (RM73B2B151JD) 150 Ω , $\pm 5\%$, 1/8W | | |
| R149 | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R150 | MF, (RM73B2B331JD) 330 Ω , $\pm 5\%$, 1/8W | | |
| R151 | MF, (RM73B2B510JD) 51 Ω , $\pm 5\%$, 1/8W | | |
| R152 | MF, (RM73B2B * JD) 0 to 220 Ω , $\pm 5\%$, 1/8W | | |
| R153 | MF, (RM73B2B330JD) 33 Ω , $\pm 5\%$, 1/8W | | |
| R154 | MF, (RM73B2B * JD) 0 to 100 Ω , $\pm 5\%$, 1/8W | | |
| R155 | MF, (RM73B2B180JD) 18 Ω , $\pm 5\%$, 1/8W | | |
| R156 | MF, (RM73B2B820JD) 82 Ω , $\pm 5\%$, 1/8W | | |
| R157 | MF, (RM73B2B330JD) 33 Ω , $\pm 5\%$, 1/8W | | |
| R158 | MF, (RM73B2B * JD) 0 to 100 Ω , $\pm 5\%$, 1/8W | | |
| R159 | MF, (RM73B2B180JD) 18 Ω , $\pm 5\%$, 1/8W | | |
| R160 | Var, MF, (RJ-6P 1K Ω) 1K Ω , 1/2W | | |
| R161 | MF, (RM73B2B331JD) 330 Ω , $\pm 5\%$, 1/8W | | |
| R162 | MF, (RM73B2B510JD) 51 Ω , $\pm 5\%$, 1/8W | | |
| R163 | MF, (RM73B2B * JD) 0 to 221 Ω , $\pm 5\%$, 1/8W | | |

() : Manufacturer's part number
* : Selected at factory

44W83357 7/9

44W83357 8/9

() : Manufacturer's part number * : Selected at factory

| REF | DESCRIPTION | RATING | NOTE |
|------|-----------------------|------------------------|---------------|
| R164 | MF, (RM73B2B330JD) | 330, ±5%, 1/8W | Qty 1 or 1, * |
| R165 | MF, (RM73B2B * JD) | 0 to 1000, ±5%, 1/8W | Qty 1 or 1, * |
| R166 | MF, (RM73B2B180JD) | 180, ±5%, 1/8W | |
| R167 | MF, (RM73B2B820JD) | 820, ±5%, 1/8W | |
| R168 | MF, (RM73B2B330JD) | 330, ±5%, 1/8W | Qty 1 or 1, * |
| R169 | MF, (RM73B2B * JD) | 0 to 1000, ±5%, 1/8W | Qty 1 or 1, * |
| R170 | MF, (RM73B2B180JD) | 180, ±5%, 1/8W | |
| R171 | Not assigned | | |
| R172 | Not assigned | | |
| R173 | Not assigned | | |
| R174 | MF, (RM73B2B510JD) | 510, ±5%, 1/8W | |
| R175 | MF, (RM73B2B510JD) | 510, ±5%, 1/8W | |
| R176 | MF, (RM73B2B510JD) | 510, ±5%, 1/8W | |
| R177 | MF, (RM73B2B510JD) | 510, ±5%, 1/8W | |
| R178 | MF, (RM73B2B * JD) | 0 to 4700, ±5%, 1/8W | Qty 1 or 1, * |
| R179 | MF, (RM73B2B * JD) | 0 to 4700, ±5%, 1/8W | Qty 1 or 1, * |
| R180 | MF, (RM73B2B472JD) | 4.7k0, ±5%, 1/8W | |
| R181 | MF, (RM73B2B * JD) | 0 to 2200, ±5%, 1/8W | Qty 1 or 1, * |
| R182 | MF, (RM73B2B * JD) | 0 to 2200, ±5%, 1/8W | Qty 1 or 1, * |
| R183 | MF, (RM73B2B472JD) | 4.7k0, ±5%, 1/8W | |
| R184 | MF, (RM73B2B103JD) | 10k0, ±5%, 1/8W | |
| R185 | MF, (RM73B2B103JD) | 10k0, ±5%, 1/8W | |
| R186 | MF, (RM73B2B * JD) | 0 to 1000, ±5%, 1/8W | Qty 1 or 1, * |
| R187 | MF, (RM73B2B510JD) | 510, ±5%, 1/8W | |
| R188 | Not assigned | | |
| R189 | Not assigned | | |
| R190 | Not assigned | | |
| R191 | Var, MF, (RJ-6P 1000) | 1000, 1/2W | |
| R192 | MF, (RM73B2B331JD) | 3300, ±5%, 1/8W | |
| R193 | MF, (RM73B2B470JD) | 470, ±5%, 1/8W | |
| R194 | MF, (RM73B2B101JD) | 1000, ±5%, 1/8W | |
| R195 | MF, (RM73B2B102JD) | 1k0, ±5%, 1/8W | |
| R196 | MF, (RM73B2B101JD) | 1000, ±5%, 1/8W | |
| R197 | MF, (RM73B2B332JD) | 3.3k0, ±5%, 1/8W | |
| R198 | MF, (RM73B2B472JD) | 4.7k0, ±5%, 1/8W | |
| R199 | MF, (RM73B2B101JD) | 1000, ±5%, 1/8W | |
| R200 | MF, (RM73B2B102JD) | 1k0, ±5%, 1/8W | |
| R201 | MF, (RM73B2B470JD) | 470, ±5%, 1/8W | |
| R202 | MF, (RM73B2B181JD) | 1800, ±5%, 1/8W | |
| R203 | Not assigned | | |
| R204 | Not assigned | | |
| R205 | Not assigned | | |
| R206 | Not assigned | | |
| R207 | MF, (RM73B2B * JD) | 100 to 4700, ±5%, 1/8W | Qty 1 or 1, * |
| R208 | Var, MF, (RJ-6P 1k0) | 1k0, 1/2W | |

44W83357 9/9

() : Manufacturer's part number * : Selected at factory

| CKT | REF | DESCRIPTION | RATING | NOTE |
|------|-----|--|--|----------------|
| R209 | | MF, (RM73B2B * JD) MF, (RM73B2B103JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R210 | | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R211 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R212 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R213 | | Not assigned | | |
| R214 | | MF, (RM73B2B * JD) MF, (RM73B2B103JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R215 | | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R216 | | Var, MF, (RJ-6P 1KΩ) MF, (RM73B2B * JD) | 1KΩ, 1/2W 0 to 100Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R217 | | MF, (RM73B2B * JD) MF, (RM73B2B103JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R218 | | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R219 | | Var, MF, (RJ-6P 1KΩ) MF, (RM73B2B * JD) MF, (RM73B2B103JD) | 1KΩ, 1/2W 0 to 100Ω, ±5%, 1/8W 10KΩ, ±5%, 1/8W | Q'ty 1 or 1, * |
| R220 | | MF, (RM73B2B * JD) MF, (RM73B2B103JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R221 | | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R222 | | Var, MF, (RJ-6P 1KΩ) MF, (RM73B2B * JD) | 1KΩ, 1/2W 100 to 472Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R223 | | MF, (RM73B2B * JD) | | |
| R224 | | Not assigned | | |
| R225 | | Not assigned | | |
| R226 | | Not assigned | | |
| R227 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R228 | | MF, (RM73B2B * JD) | 0 to 100Ω, ±5%, 1/8W | Q'ty 1 or 1, * |
| R229 | | MF, (RM73B2B103JD) | 10KΩ, ±5%, 1/8W | |
| R230 | | Var, MF, (RJ-6P 1KΩ) MF, (RM73B2B220JD) | 1KΩ, 1/2W 22Ω, ±5%, 1/8W | |
| R231 | | MF, (RM73B2B220JD) | | |
| R232 | | Not assigned | | |
| R233 | | MF, (RM73B2B510JD) | 51Ω, ±5%, 1/8W | |
| R234 | | MF, (RM73B2B102JD) | 1KΩ, ±5%, 1/8W | |
| R235 | | MF, (RM73B2B101JD) | 100Ω, ±5%, 1/8W | |
| R236 | | MF, (RM73B2B222JD) | 2.2KΩ, ±5%, 1/8W | |
| R237 | | MF, (RM73B2B332JD) | 3.3KΩ, ±5%, 1/8W | |
| R238 | | Var, MF, (RJ-6P 2KΩ) | 2KΩ, 1/2W | |

| CKT REF | DESCRIPTION | RATING | NOTE |
|---------|-----------------------------|--------|------|
| J 1 | Cable, (CNF23-34D-AA40S) | | |
| Q 1 | IC, (LN513GA) | | |
| Q 2 | IC, (LN513GA) | | |
| Q 3 | IC, (LN513GA) | | |
| Q 4 | IC, (LN513GA) | | |
| Q 5 | IC, (LN513GA) | | |
| Q 6 | IC, (LN513GA) | | |
| Q 7 | IC, (LN513GA) | | |
| Q 8 | IC, (LN513GA) | | |
| Q 9 | IC, (LN513GA) | | |
| Q 10 | IC, (LN513GA) | | |
| Q 11 | IC, (LN342GPH) | | |
| Q 12 | IC, (LN342GPH) | | |
| Q 13 | IC, (LN345GPH) | | |
| S 1 | Switch, (KEG10901) | | |
| S 2 | Switch, (KEG10901) | | |
| S 3 | Switch, (KEG10901) | | |
| S 4 | Switch, (KEG10901) | | |
| S 5 | Switch, (KEG10901) | | |
| S 6 | Switch, (KEG10901) | | |
| S 7 | Switch, (KEG10901) | | |
| S 8 | Switch, (KEG10901) | | |
| S 9 | Switch, (HL-20NS) | | |
| S 10 | Switch, (HL-20NS) | | |
| S 11 | Switch, (HL-20LSYG) | | |

() : Manufacturer's part number
 * : Selected at factory

44W83360 1/1

