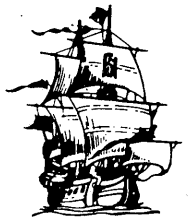


# handic<sup>®</sup>



## SERVICE MANUAL

## FOR

## handic<sup>®</sup> 605 DL/1605 DL

## CITIZEN'S BAND TRANSCEIVER

## MOBILE TYPE

## 6 CHANNELS 5 WATT



**handic**  
bolagen



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# SPECIFICATIONS

| Description                | Nominal spec.                                                                       |
|----------------------------|-------------------------------------------------------------------------------------|
| 1605DL                     |                                                                                     |
| Frequency range            | 27.005 – 27.135 MHz                                                                 |
| Operating voltage          | 13.2 V DC $\pm$ 15%                                                                 |
| Total DC input             | 2 watts at 13.2 V                                                                   |
| RF output                  | 0.5 watts at 13.2 V                                                                 |
| 605DL                      |                                                                                     |
| Frequency range            | 26.965 – 27.225 MHz                                                                 |
| Operating voltage          | 13.8 V DC $\pm$ 15%                                                                 |
| DC input                   | 5 watts (Swedish model)                                                             |
| RF output                  | 4 watts (U.S. model)                                                                |
| Frequency tolerance        | Less than $\pm$ 0.003%                                                              |
| Modulation                 | AM below 100%                                                                       |
| Sensitivity                | 0.7 $\mu$ V at 10 dB (S+N)/N @50mW                                                  |
| Selectivity                | –60 dB at $\pm$ 10 kHz                                                              |
| Adjacent channel rejection | –60 dB                                                                              |
| Intermediate frequency     | 455 kHz                                                                             |
| Signal to noise ratio      | 45 dB at 1 mV input                                                                 |
| Squelch sensitivity        |                                                                                     |
| Threshold                  | Less than 1 $\mu$ V                                                                 |
| Tight                      | 50 $\mu$ V to 1 mV                                                                  |
| Audio output               |                                                                                     |
| 10% THD                    | 2.2 watts (8 $\Omega$ )                                                             |
| Max.                       | 3.5 watts (8 $\Omega$ )                                                             |
| Semiconductors             | 1 Integrated circuit, 12 Transistors, 13 Diodes,<br>1 Thermistor and 2 Zener diodes |
| Microphone                 | Dynamic type with PTT switch (h a n d i c 44)                                       |
| Controls                   | Volume with power switch, squelch and channel selector                              |
| Jacks                      | External speaker, selective call and antenna                                        |
| Speaker                    | 8 $\Omega$ , 57 mm., Dynamic type                                                   |
| DC power cable length      | More than 3 feet with in-line fuse                                                  |
| Size                       | 42(H) x 116(W) x 166(D) mm.                                                         |

# DISASSEMBLY INSTRUCTION

Removal of the cabinet:

1. Remove the car mounting bracket screws (A) (one from each side of the unit) and remove the Mounting Bracket as shown.
2. Remove two screws (B) and pull out the chassis as shown.

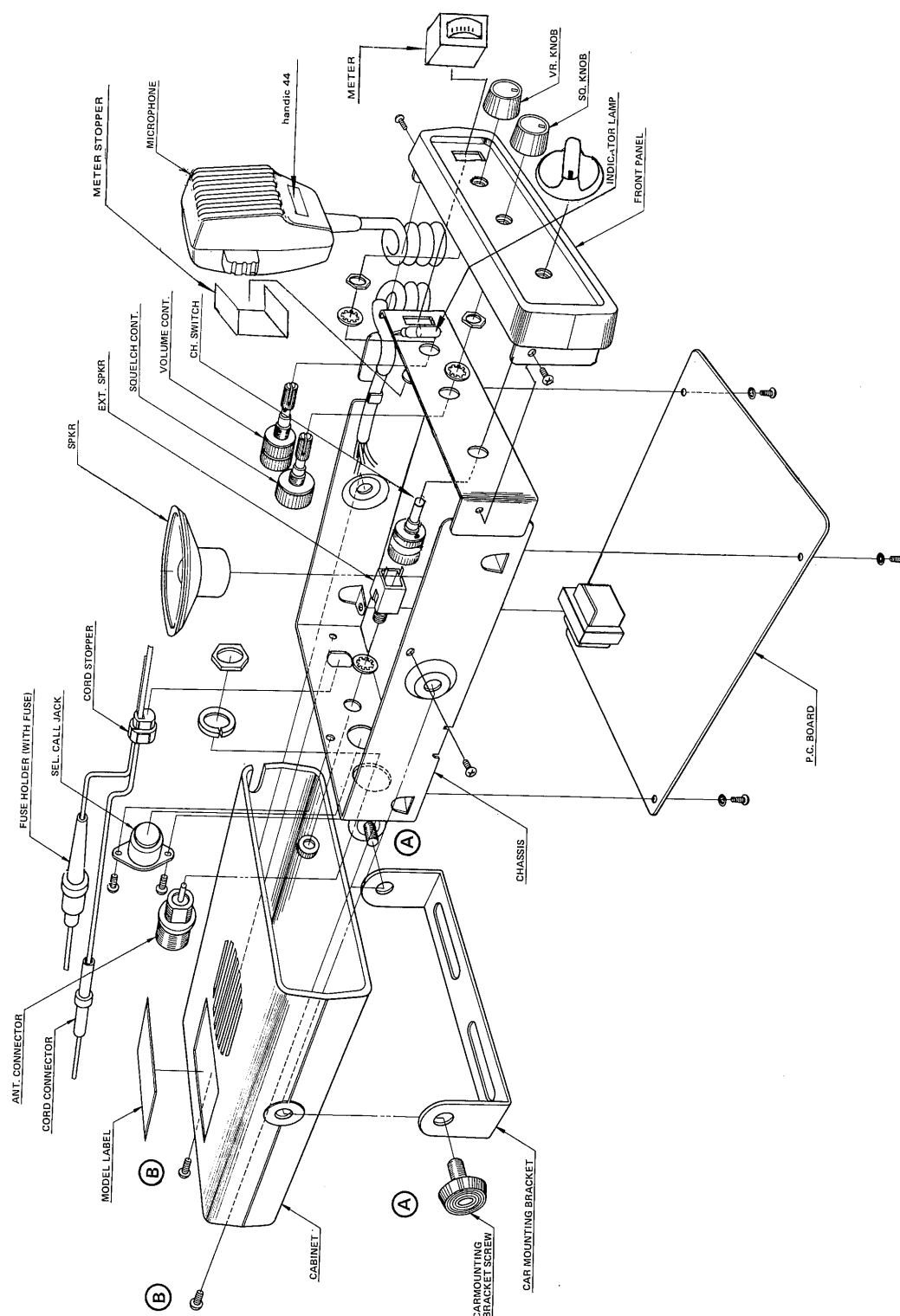


Fig. 1

## CRYSTAL INSTALLATION

Channel 15 (27.135 MHz) is supplied with the unit. Other channels can be operated by installing suitable crystals in the internal crystal sockets. Crystal sockets are located inside the case, on the printed circuit board. Push out the chassis as shown in the figure below. Plug crystals into the sockets on the printed circuit board. Plug Transmit(TX) crystals into TX sockets and Receiver(RX) crystals into RX sockets. Do NOT interchange or mix RX and TX crystals. Do always have a matched pair in the crystal sockets.

Order crystals from **h a n d i c**, stating channel number and frequency. **h a n d i c** is not responsible for poor operation when crystals of another manufacturer are used.

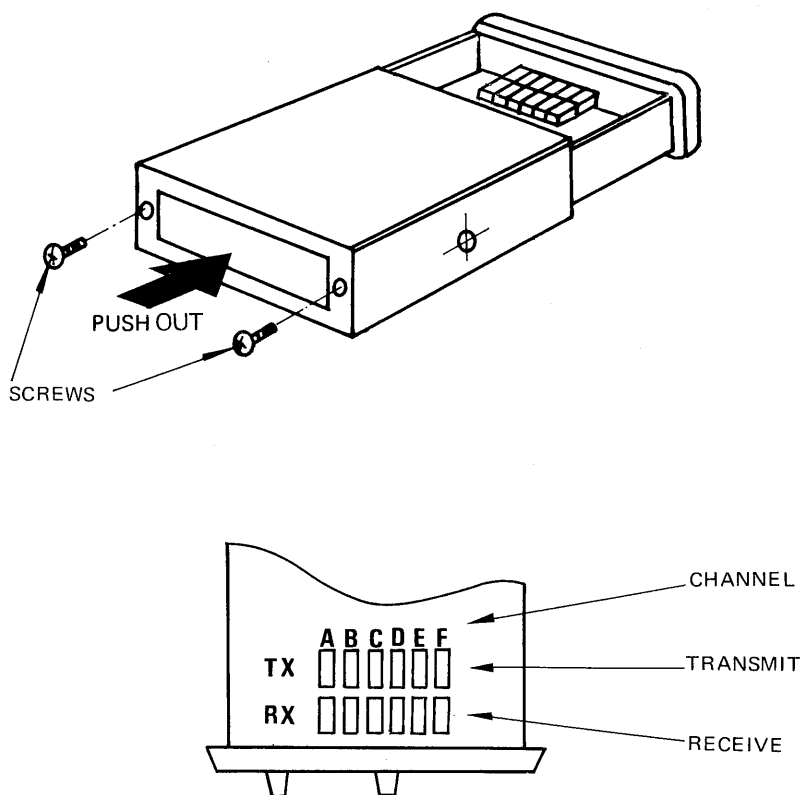


Fig. 2

## SELECTIVE CALL

Selective call 6 P DIN jack is provided on the back of the cabinet.

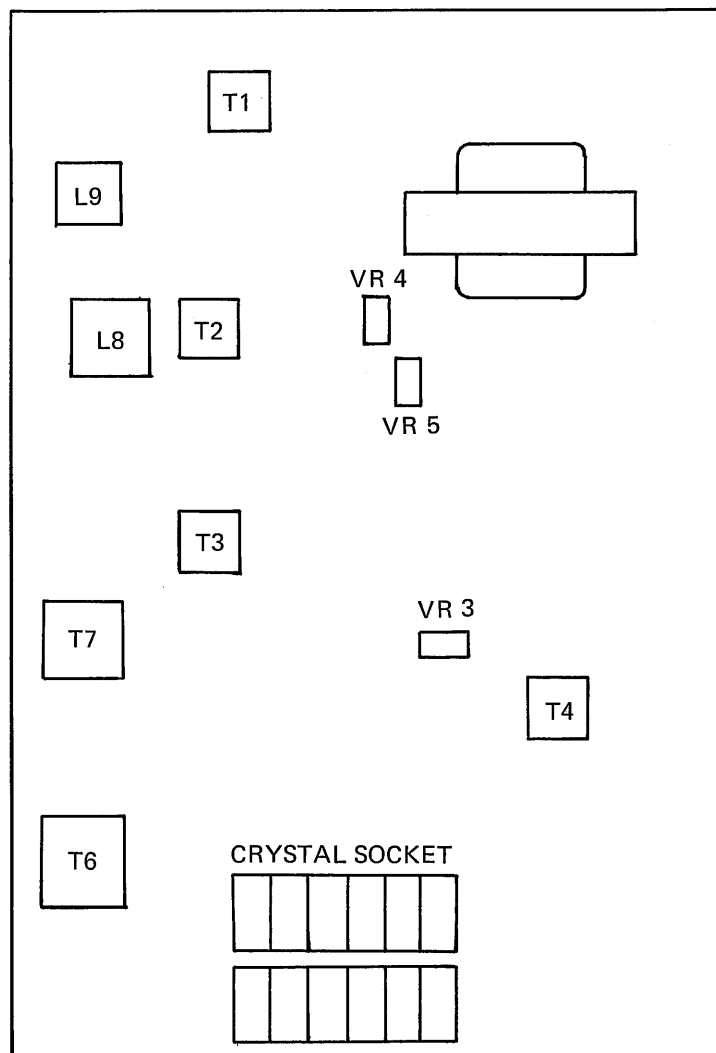
This jack is matched for **h a n d i c** S-10 and S-12 selective call units.

# GENERAL ALIGNMENT INSTRUCTIONS

## Test equipment required

- |                                          |                           |
|------------------------------------------|---------------------------|
| 1. RF standard signal generator (S.S.G.) | 6. Oscilloscope           |
| 2. AF signal generator                   | 7. Frequency counter      |
| 3. V.T.V.M. (AC)                         | 8. Monitor receiver       |
| 4. V.T.V.M. (DC)                         | 9. 1 A DC ammeter         |
| 5. RF power meter                        | 10. 8 $\Omega$ dummy load |

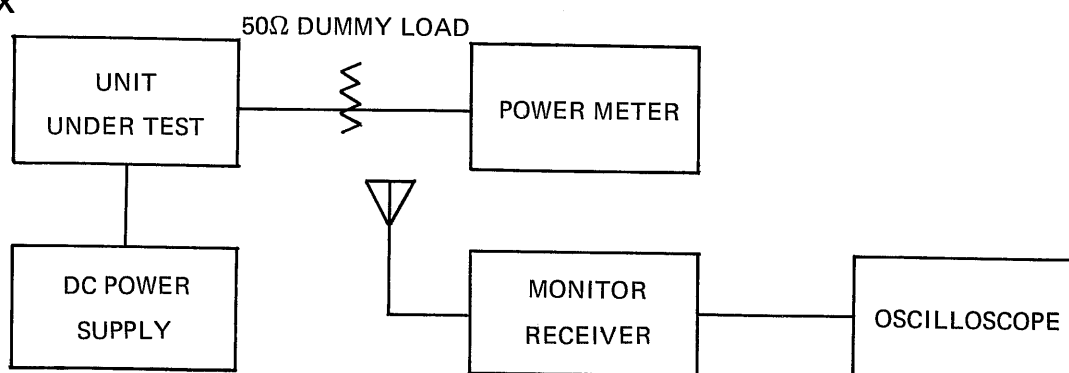
## ALIGNMENT POSITIONS



# TRANSMITTER SECTION ALIGNMENT CHART

| STEP | CONTROL SETTING                     | TEST EQUIPMENT CONNECTION                                                                                                                                                                | POWER SUPPLY VOLTAGE                                                             | ADJUST | REMARKS                                                                                       |
|------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------|
| 1    | CH: A position<br>27.135 MHz        | Power meter (50 $\Omega$ ):<br>to ANT. jack<br>1A ammeter:<br>in series with lead<br>between modulation<br>winding of T5 and<br>collector of Q12<br>Oscilloscope:<br>to monitor receiver | Supply voltage:<br>13.8 volts<br>for handie 605<br>13.2 volts<br>for handie 1605 |        |                                                                                               |
| 2    | Press the P.T.T.<br>SW              | "                                                                                                                                                                                        | "                                                                                | T6, 7  | Max. power<br>output                                                                          |
| 3    | "                                   | "                                                                                                                                                                                        | "                                                                                | L8, 9  | Peak on the<br>power meter<br>and dip on the<br>ammeter to get<br>max. output at<br>ANT. jack |
| 4    | "                                   | Power meter (50 $\Omega$ ):<br>to ANT. Jack<br>1A ammeter:<br>in series with lead<br>between modulation<br>winding of T5 and<br>collector of Q12                                         | Vary supply<br>voltage from<br>15 to 10 volts                                    | T6     | If no output,<br>adjust T6 to<br>assure output<br>at both voltage<br>extremes.                |
| 5    | "                                   | Audio frequency<br>generator: to TP3<br>MOD. 50% + 20 dB<br>FREQ. 2.5kHz                                                                                                                 | Reset the supply<br>voltage                                                      | VR4    | Check modula-<br>tion MOD. 90 –<br>100% (But not so<br>that over modu-<br>lation occurs)      |
| 6    | Repeat steps 2<br>to 4 if necessary |                                                                                                                                                                                          |                                                                                  |        |                                                                                               |
| 7    | Press the P.T.T.<br>SW              | Power meter (50 $\Omega$ )                                                                                                                                                               |                                                                                  | VR5    | 4 reading on the<br>meter                                                                     |

TX

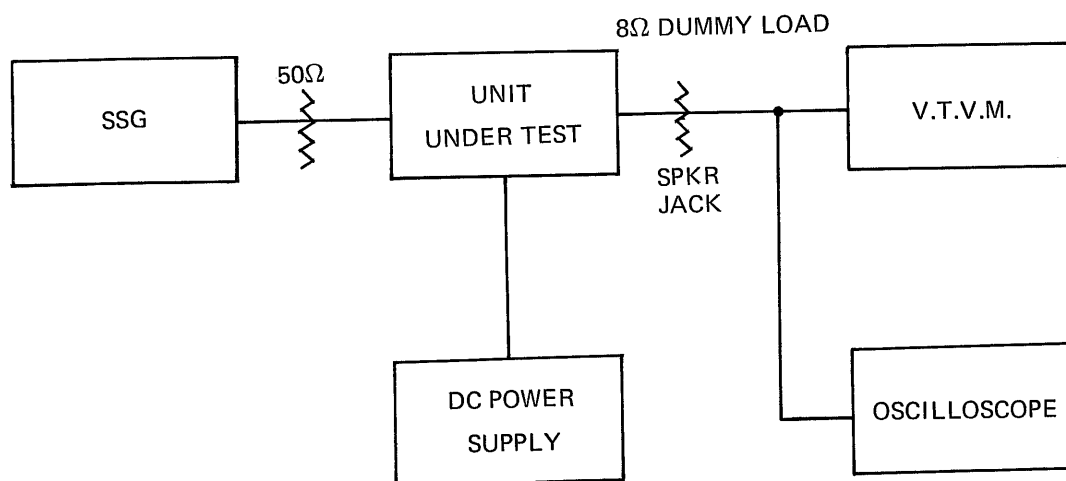


# RECEIVER SECTION ALIGNMENT CHART

| STEP | CONTROL SETTING                                                                                               | TEST EQUIPMENT CONNECTION                                                                                                                        | SIGNAL GENERATOR SETTING                                    | ADJUST   | REMARKS                                    |
|------|---------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|----------|--------------------------------------------|
| 1    | Volume control:<br>Fully clockwise<br>SQ. control:<br>Max. counter-clockwise<br>CH.: A position<br>27.135 MHz | V.T.V.M.:<br>Parallel with $8\Omega$<br>dummy load<br>connected to EXT.<br>SPKR Jack<br>Signal generator:<br>through 100 pF to<br>the base of Q2 | Freq.: 455 kHz<br>Mod.: 1 kHz 30%                           | T3<br>T4 | Max. output<br>on V.T.V.M.                 |
| 2    | "                                                                                                             | V.T.V.M.:<br>Parallel with $8\Omega$<br>dummy load<br>connected to EXT.<br>SPKR Jack<br>Signal generator:<br>to ANT. Jack                        | Freq.: 27.135 MHz<br>Mod.: 1 kHz                            | T1, 2    | Max. S/N and<br>max. output on<br>V.T.V.M. |
| 3    | Volume control:<br>Adjust for<br>desired audio<br>level<br>SQ. control:<br>Fully clockwise                    | V.T.V.M.:<br>Parallel with $8\Omega$<br>dummy load<br>connected to<br>EXT. SPKR Jack<br>Signal generator:<br>to ANT. Jack                        | Freq.: 27.135 MHz<br>Mod.: 1 kHz 30%<br>Output: 500 $\mu$ V | VR3      | Adjust so squelch<br>just opens            |

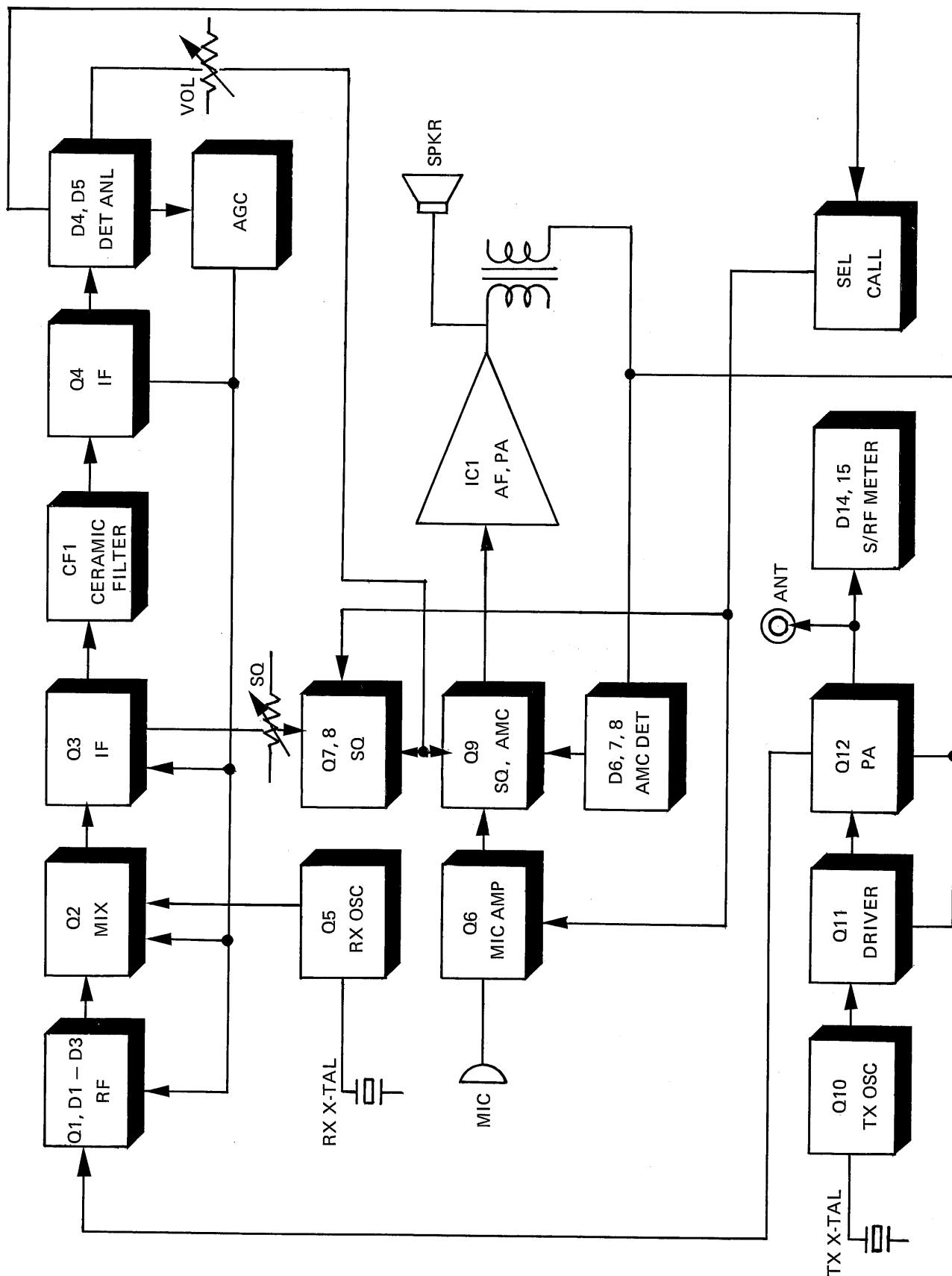
**Note:** Keep the input signal from S.S.G. as low as possible during all alignment.

RX

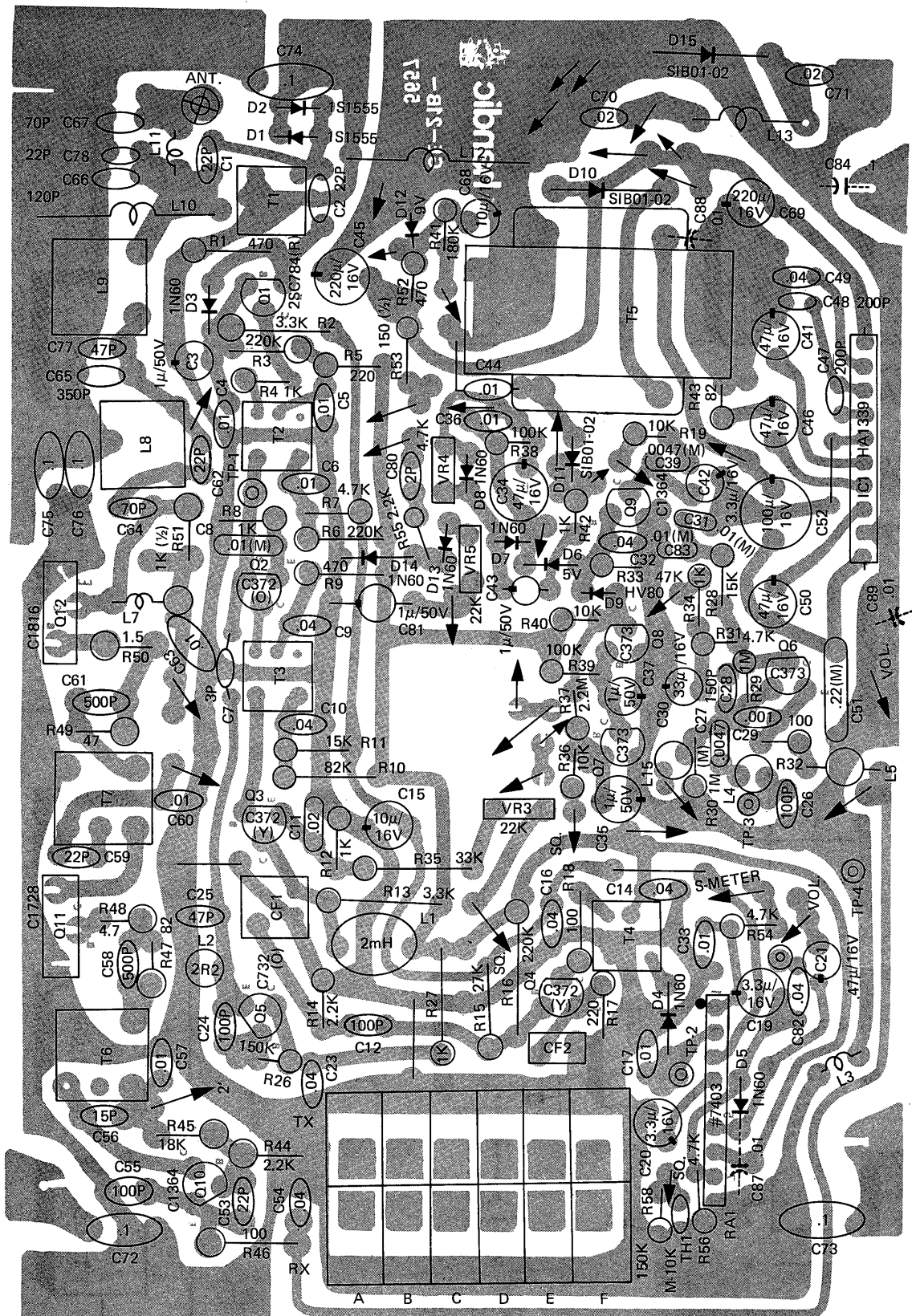




# BLOCK DIAGRAM

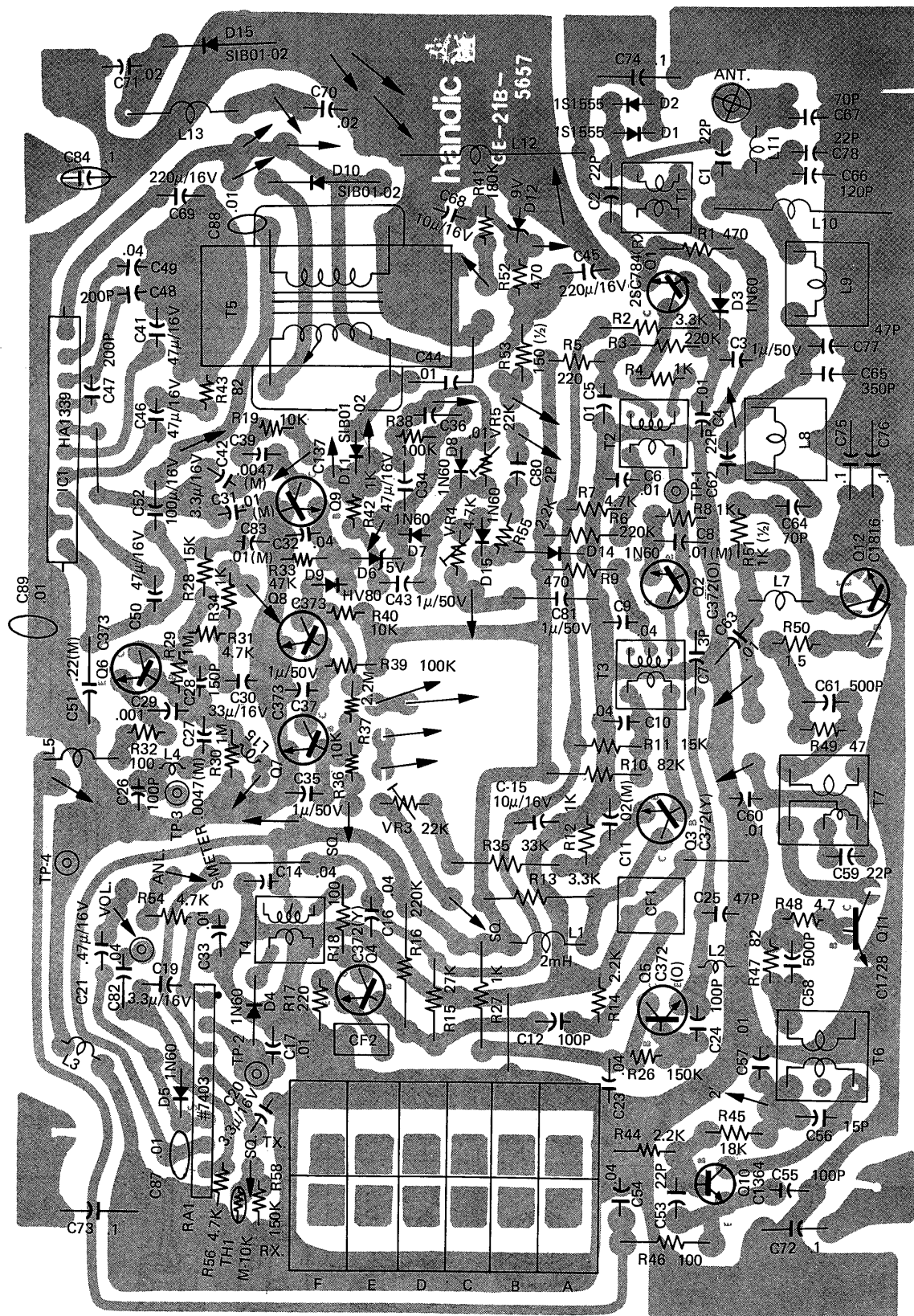


# PRINTED CIRCUIT BOARD TOP VIEW



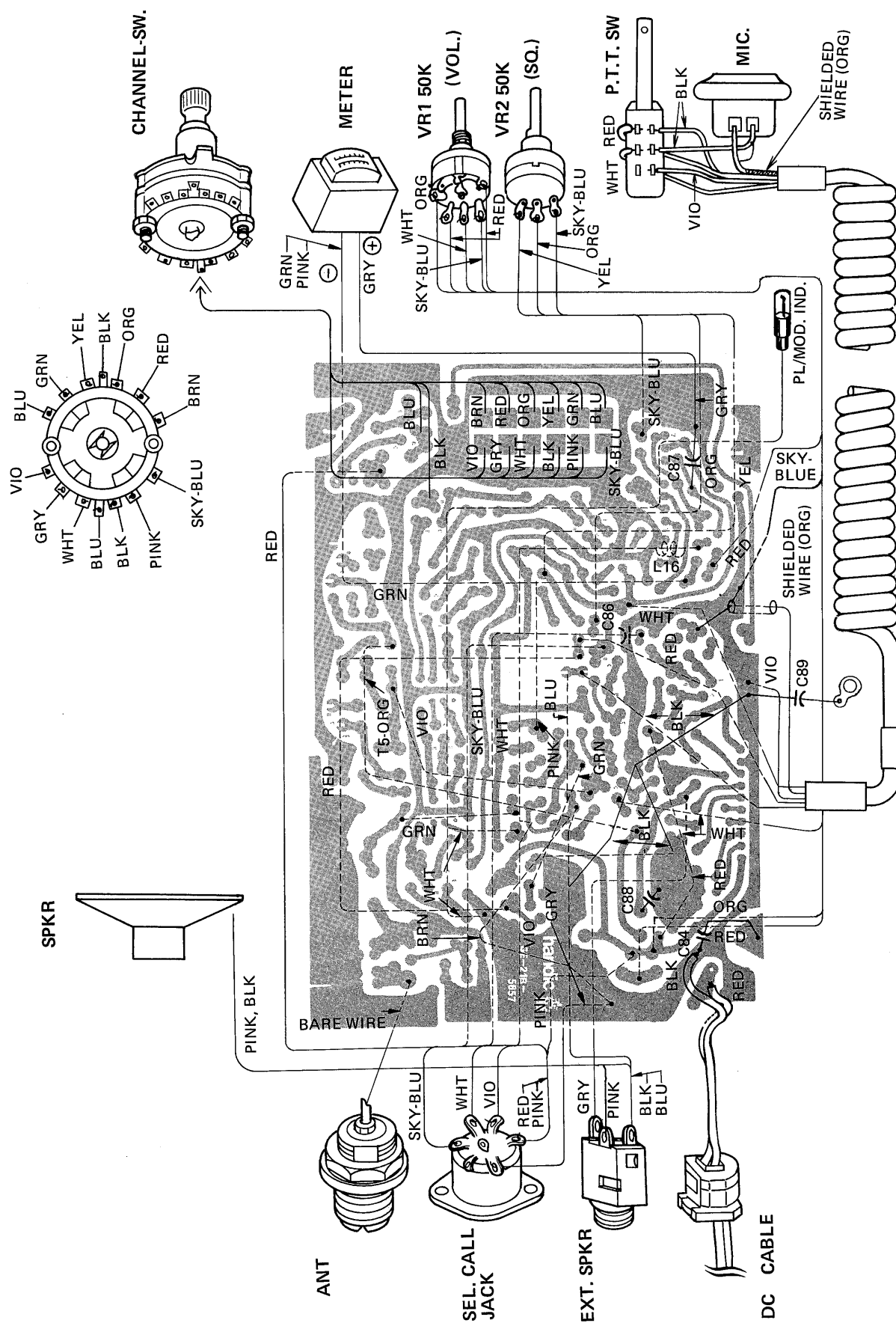
NOTE: Refer to the Parts list for handiic 1605DL.

# PRINTED CIRCUIT BOARD BOTTOM VIEW



NOTE: Refer to the Parts list for handie 1605DL.

## WIRING DIAGRAM



## TROUBLE SHOOTING

| Symptom                                                                 | Possible cause                                                                                                                                                                                                                                               |
|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1) Pilot lamp does not light and set does not operate when power is on. | A) Faulty power cord.<br>B) Defective power switch SW3.<br>C) Fuse blown.<br>D) Defective diode D13.                                                                                                                                                         |
| 2) Fuse blows when power switch is on.                                  | A) Defective electrolytic capacitor.<br>B) Defective audio power amplifier Integrated circuit IC 1<br>C) Defective TX final transistor Q11 or Q12                                                                                                            |
| 3) Pilot lamp does not light.                                           | A) Defective pilot lamp or resistor R53.<br>B) Open circuit in the B+ Circuit.                                                                                                                                                                               |
| 4) Pilot lamp comes on but no sound on any channel.                     | A) Faulty EXT. speaker jack.<br>B) Poor crystal socket contact or crystal loose in socket.<br>C) Weak crystal.                                                                                                                                               |
| 5) Transmitter does not operate or no modulation.                       | A) Faulty P.T.T. switch.<br>B) Defective microphone cartridge.<br>C) Faulty transistor Q10, 11 or Q12.<br>D) Faulty microphone cord.<br>E) Defective T5 transformer modulation winding.<br>F) Defective resistor R47, 49 or R50.<br>G) Faulty transistor Q6. |
| 6) Squelch control does not operate.                                    | A) Defective transistor Q7, Q8 or Q9.<br>B) Faulty VR2 or VR3.                                                                                                                                                                                               |

# PARTS LIST

| Ref. No.   | Description  |          |      |            | h a n d i c<br>Stock Number | MFR'S<br>Parts Number |
|------------|--------------|----------|------|------------|-----------------------------|-----------------------|
| CAPACITORS |              |          |      |            |                             |                       |
| C1         | Ceramic      | 22pF     | 50WV | ±5%        | 990253                      | FC-50                 |
| C2         | Ceramic      | 22pF     | 50WV | ±5%        | 990253                      | FC-50                 |
| C3         | Electrolytic | 1μF      | 50WV | −10 − +75% | 990008                      | CE04W1H010E           |
| C4         | Ceramic      | 0.01μF   | 25WV | −20 − +80% | 990477                      | MC-70                 |
| C5         | Ceramic      | 0.01μF   | 25WV | −20 − +80% | 990477                      | MC-70                 |
| C6         | Ceramic      | 0.01μF   | 25WV | −20 − +80% | 990477                      | MC-70                 |
| C7         | Ceramic      | 3PF      | 50WV | ±0.5%      |                             | FC-50                 |
| C8         | Mylar        | 0.01μF   | 25WV | ±20%       | 990099                      |                       |
| C9         | Ceramic      | 0.04μF   | 25WV | −20 − +80% | 990491                      | MC-100                |
| C10        | Ceramic      | 0.04μF   | 25WV | −20 − +80% | 990491                      | MC-100                |
| C11        | Mylar        | 0.02μF   | 25WV | ±20%       | 990106                      |                       |
| C12        | Ceramic      | 200pF    | 50WV | ±10%       | 990295                      | FC-70                 |
| C13        | Not used     |          |      |            |                             |                       |
| C14        | Ceramic      | 0.04μF   | 25WV | −20 − +80% | 990491                      | MC-100                |
| C15        | Electrolytic | 10μF     | 16WV | −10 − +80% | 990036                      | CE04W1C100C           |
| C16        | Ceramic      | 0.04μF   | 25WV | −20 − +80% | 990491                      | MC-100                |
| C17        | Ceramic      | 0.01μF   | 25WV | −20 − +80% | 990477                      | MC-70                 |
| C18        | Not used     |          |      |            |                             |                       |
| C19        | Electrolytic | 3.3μF    | 16WV | −10 − +75% | 990554                      | CE04W1C3R3C           |
| C20        | Electrolytic | 3.3μF    | 16WV | −10 − +75% | 990554                      | CE04W1C3R3C           |
| C21        | Electrolytic | 0.47μF   | 50WV | −10 − +75% | 990001                      | CE04W1HR47A           |
| C22        | Not used     |          |      |            |                             |                       |
| C23        | Ceramic      | 0.04μF   | 25WV | −20 − +80% | 990491                      | MC-100                |
| C24        | Ceramic      | 100pF    | 50WV | ±10%       | 990295                      | FC-70                 |
| C25        | Ceramic      | * 47pF   | 50WV | ±10%       | 990274                      | FC-60                 |
| C26        | Ceramic      | 100pF    | 50WV | ±10%       | 990295                      | FC-70                 |
| C27        | Mylar        | 0.0047μF | 50WV | ±20%       |                             |                       |
| C28        | Ceramic      | 150P     | 50WV | ±20%       | 990309                      | FC-80                 |
| C29        | Ceramic      | 0.001μF  | 50WV | ±10%       | 990463                      | MC-60                 |
| C30        | Electrolytic | 33μF     | 16WV | −10 − +80% |                             | CE04W1C-330C          |
| C31        | Mylar        | 0.01μF   | 25WV | ±20%       | 990099                      |                       |
| C32        | Ceremic      | 0.04μF   | 25WV | −20 − +80% | 990491                      | MC-100                |
| C33        | Ceramic      | 0.01μF   | 25WV | −20 − +80% | 990477                      | MC-70                 |
| C34        | Electrolytic | 47μF     | 16WV | −10 − +50% | 990043                      | CE04W1C470B           |
| C35        | Electrolytic | 1μF      | 50WV | −10 − +75% | 990008                      | CE04W1H010E           |
| C36        | Ceramic      | 0.01μF   | 25WV | −20 − +80% | 990477                      | MC-70                 |
| C37        | Electrolytic | 1μF      | 50WV | −10 − +75% | 990008                      | CE04W1H010E           |
| C38        | Not used     |          |      |            |                             |                       |
| C39        | Mylar        | 0.0047μF | 50WV | ±20%       |                             |                       |
| C40        | Not used     |          |      |            |                             |                       |
| C41        | Electrolytic | * 47μF   | 16WV | −10 − +50% | 990043                      | CE04W1C470B           |
| C42        | Electrolytic | 3.3μF    | 16WV | −10 − +75% | 990554                      | CE04W1C3R3C           |
| C43        | Electrolytic | 1μF      | 50WV | −10 − +75% | 990008                      | CE04W1H010E           |
| C44        | Ceramic      | 0.01μF   | 25WV | −20 − +80% | 990477                      | MC-70                 |
| C45        | Electrolytic | 220μF    | 16WV | −10 − +50% | 990057                      | CE04W1C221E           |
| C46        | Electrolytic | 47μF     | 16WV | −10 − +50% | 990043                      | CE04W1C470B           |
| C47        | Ceramic      | 200pF    | 50WV | ±20%       |                             | FC-80                 |
| C48        | Ceramic      | 200pF    | 50WV | ±20%       |                             | FC-80                 |
| C49        | Ceramic      | 0.04μF   | 25WV | −20 − +80% | 990491                      | MC-100                |
| C50        | Electrolytic | 47μF     | 16WV | −10 − +50% | 990043                      | CE04W1C470B           |

\* Not in 1605DL

| Ref. No.  | Description  |                |      |                    | h a n d i c<br>Stock Number | MFR'S<br>Parts Number |
|-----------|--------------|----------------|------|--------------------|-----------------------------|-----------------------|
| C51       | Mylar        | 0.22 $\mu$ F   | 50WV | $\pm 20\%$         |                             |                       |
| C52       | Electrolytic | 100 $\mu$ F    | 16WV | -10 - +50%         | 990050                      | CE04W1C101F           |
| C53       | Ceramic      | 22pF           | 50WV | $\pm 5\%$          | 990253                      | FC-50                 |
| C54       | Ceramic      | 0.04 $\mu$ F   | 25WV | -20 - +80%         | 990491                      | MC-100                |
| C55       | Ceramic      | 100pF          | 50WV | $\pm 10\%$         | 990295                      | FC-70                 |
| C56       | Ceramic      | 15pF           | 50WV | $\pm 10\%$         | 990246                      | FC-50                 |
| C57       | Ceramic      | 0.01 $\mu$ F   | 25WV | -20 - +80%         | 990477                      | MC-70                 |
| C58       | Ceramic      | 500pF          | 50WV | $\pm 10\%$         | 990365                      | FC-100                |
| C59       | Ceramic      | *22pF          | 50WV | $\pm 5\%$          | 990253                      | FC-50                 |
| C60       | Ceramic      | 0.01 $\mu$ F   | 25WV | -20 - +80%         | 990477                      | MC-70                 |
| C61       | Ceramic      | 500pF          | 50WV | $\pm 10\%$         | 990365                      | FC-100                |
| C62       | Ceramic      | 22pF           | 50WV | $\pm 10\%$         | 990253                      | FC-50                 |
| C63       | Ceramic      | 0.01 $\mu$ F   | 25WV | -20 - +80%         | 990477                      | MC-70                 |
| C64       | Ceramic      | 70pF           | 50WV | $\pm 10\%$         | 990288                      | FC-70                 |
| C65       | Ceramic      | *350pF         | 50WV | $\pm 20\%$         | 990358                      | FC-100                |
| C66       | Ceramic      | *120pF         | 50WV | $\pm 20\%$         |                             | FC-80                 |
| C67       | Ceramic      | *70pF          | 50WV | $\pm 10\%$         | 990288                      | FC-70                 |
| C68       | Electrolytic | 10 $\mu$ F     | 16WV | -10 - +50%         | 990036                      | CE04W1C100C           |
| C69       | Electrolytic | 220 $\mu$ F    | 16WV | -10 - +50%         | 990057                      | CE04W1C221E           |
| C70       | Ceramic      | 0.02 $\mu$ F   | 25WV | -20 - +80%         | 990484                      | MC-75                 |
| C71       | Ceramic      | 0.02 $\mu$ F   | 25WV | -20 - +80%         | 990484                      | MC-75                 |
| C72       | Ceramic      | 0.1 $\mu$ F    | 25WV | -20 - +80%         | 990498                      | MMC-135               |
| C73       | Ceramic      | 0.1 $\mu$ F    | 25WV | -20 - +80%         | 990498                      | MMC-135               |
| C74       | Ceramic      | 0.1 $\mu$ F    | 25WV | -20 - +80%         | 990498                      | MMC-135               |
| C75       | Ceramic      | 0.1 $\mu$ F    | 25WV | -20 - +80%         | 990498                      | MMC-135               |
| C76       | Ceramic      | 0.1 $\mu$ F    | 25WV | -20 - +80%         | 990498                      | MMC-135               |
| C77       | Ceramic      | *47pF          | 50WV | $\pm 10\%$         | 990274                      | FC-60                 |
| C78       | Ceramic      | 22pF           | 50WV | $\pm 5\%$          | 990253                      | FC-50                 |
| C79       | Not used     |                |      |                    |                             |                       |
| C80       | Ceramic      | 2pF            | 50WV | $\pm 0.5\text{pF}$ | 990211                      | FC-50                 |
| C81       | Electrolytic | 1 $\mu$ F      | 50WV | -10 - +75%         | 990008                      | CE0411H010E           |
| C82       | Ceramic      | 0.04 $\mu$ F   | 25WV | -20 - +80%         | 990491                      | MC-100                |
| C83       | Mylar        | 0.01 $\mu$ F   | 25WV | $\pm 20\%$         | 990099                      |                       |
| C84       | Ceramic      | *0.1 $\mu$ F   | 25WV | -20 - +80%         | 990498                      | MMC-135               |
| C85       | Not used     |                |      |                    |                             |                       |
| C86       | Mylar        | 0.0047 $\mu$ F | 50WV | $\pm 20\%$         |                             |                       |
| C87       | Ceramic      | 0.01 $\mu$ F   | 25WV | -20 - +80%         | 990477                      | MC-70                 |
| C88       | Ceramic      | 0.01 $\mu$ F   | 25WV | -20 - +80%         | 990477                      | MC-70                 |
| C89       | Ceramic      | 0.01 $\mu$ F   | 25WV | -20 - +80%         | 990477                      | MC-70                 |
| RESISTORS |              |                |      |                    |                             |                       |
| R1        | Carbon film  | 470            | 1/4W | $\pm 5\%$          | 951477                      | 14VJ-471              |
| R2        | Carbon film  | 3.3K           | 1/4W | $\pm 5\%$          | 951617                      | 14VJ-332              |
| R3        | Carbon film  | 220K           | 1/4W | $\pm 5\%$          | 951925                      | 14VJ-224              |
| R4        | Carbon film  | 1K             | 1/4W | $\pm 5\%$          | 951533                      | 14VJ-102              |
| R5        | Carbon film  | 220            | 1/4W | $\pm 5\%$          | 951421                      | 14VJ-221              |
| R6        | Carbon film  | 220K           | 1/4W | $\pm 5\%$          | 951925                      | 14VJ-224              |
| R7        | Carbon film  | 4.7K           | 1/4W | $\pm 5\%$          | 951645                      | 14VJ-472              |
| R8        | Carbon film  | 1K             | 1/4W | $\pm 5\%$          | 951533                      | 14VJ-102              |
| R9        | Carbon film  | 470            | 1/4W | $\pm 5\%$          | 951477                      | 14VJ-471              |
| R10       | Carbon film  | 82K            | 1/4W | $\pm 5\%$          | 951855                      | 14VJ-823              |

\* Not in 1605DL



| Ref No.        | Description    |         |      |         |  | h a n d i c<br>Stock Number | MFR'S<br>Parts Number |
|----------------|----------------|---------|------|---------|--|-----------------------------|-----------------------|
| R11            | Carbon film    | 15K     | 1/4W | ±5%     |  | 951729                      | 14VJ-153              |
| R12            | Carbon film    | 1K      | 1/4W | ±5%     |  | 951533                      | 14VJ-102              |
| R13            | Carbon film    | 3.3K    | 1/4W | ±5%     |  | 951617                      | 14VJ-332              |
| R14            | Carbon film    | 2.2K    | 1/4W | ±5%     |  | 951589                      | 14VJ-222              |
| R15            | Carbon film    | 27K     | 1/4W | ±5%     |  | 951771                      | 14VJ-273              |
| R16            | Carbon film    | 220K    | 1/4W | ±5%     |  | 951925                      | 14VJ-224              |
| R17            | Carbon film    | 220     | 1/4W | ±5%     |  | 951421                      | 14VJ-221              |
| R18            | Carbon film    | 100     | 1/4W | ±5%     |  | 951365                      | 14VJ-101              |
| R19            | Carbon film    | 10K     | 1/4W | ±5%     |  | 951701                      | 14VJ-103              |
| R20            | Resistor arrey | 1K      | 1/4W | ±5%     |  |                             | 7403                  |
| R21            | Resistor arrey | 10K     | 1/4W | ±5%     |  |                             |                       |
| R22            | Resistor arrey | 33K     | 1/4W | ±5%     |  |                             |                       |
| R23            | Resistor arrey | 33K     | 1/4W | ±5%     |  |                             |                       |
| R24            | Resistor arrey | 470K    | 1/4W | ±5%     |  |                             |                       |
| R25            | Resistor arrey | 10K     | 1/4W | ±5%     |  |                             |                       |
| R26            | Carbon film    | *150K   | 1/4W | ±5%     |  | 951897                      | 14VJ-154              |
| R27            | Carbon film    | 1K      | 1/4W | ±5%     |  | 951533                      | 14VJ-102              |
| R28            | Carbon film    | 15K     | 1/4W | ±5%     |  | 951729                      | 14VJ-153              |
| R29            | Carbon film    | 1M      | 1/4W | ±5%     |  | 952037                      | 14VJ-105              |
| R30            | Carbon film    | 1M      | 1/4W | ±5%     |  | 952037                      | 14VJ-105              |
| R31            | Carbon film    | 4.7K    | 1/4W | ±5%     |  | 951645                      | 14VJ-472              |
| R32            | Carbon film    | 100     | 1/4W | ±5%     |  | 951365                      | 14VJ-101              |
| R33            | Carbon film    | 47K     | 1/4W | ±5%     |  | 951813                      | 14VJ-473              |
| R34            | Carbon film    | 1K      | 1/4W | ±5%     |  | 951533                      | 14VJ-102              |
| R35            | Carbon film    | 33K     | 1/4W | ±5%     |  | 951785                      | 14VJ-333              |
| R36            | Carbon film    | 10K     | 1/4W | ±5%     |  | 951701                      | 14VJ-103              |
| R37            | Carbon film    | 2.2M    | 1/4W | ±5%     |  | 952044                      | 14VJ-225              |
| R38            | Carbon film    | 100K    | 1/4W | ±5%     |  | 951869                      | 14VJ-104              |
| R39            | Carbon film    | 100K    | 1/4W | ±5%     |  | 951869                      | 14VJ-104              |
| R40            | Carbon film    | 10K     | 1/4W | ±5%     |  | 951701                      | 14VJ-103              |
| R41            | Carbon film    | 180K    | 1/4W | ±5%     |  | 951911                      | 14VJ-184              |
| R42            | Carbon film    | 1K      | 1/4W | ±5%     |  | 951533                      | 14VJ-102              |
| R43            | Carbon film    | 82      | 1/4W | ±5%     |  | 951351                      | 14VJ-820              |
| R44            | Carbon film    | 2.2K    | 1/4W | ±5%     |  | 951589                      | 14VJ-222              |
| R45            | Carbon film    | 18K     | 1/4W | ±5%     |  | 951743                      | 14VJ-183              |
| R46            | Carbon film    | 100     | 1/4W | ±5%     |  | 951365                      | 14VJ-101              |
| R47            | Carbon film    | 82      | 1/4W | ±5%     |  | 951351                      | 14VJ-820              |
| R48            | Carbon film    | 4.7     | 1/4W | ±5%     |  | 951141                      | 14VJ-4R7              |
| R49            | Carbon film    | *47     | 1/4W | ±5%     |  | 951309                      | 14VJ-470              |
| R50            | Carbon film    | *1.5    | 1/4W | ±5%     |  | 951057                      | 14VJ-1R5              |
| R51            | Carbon film    | 1K      | 1/2W | ±10%    |  | 954130                      | 12TK-102              |
| R52            | Carbon film    | 470     | 1/4W | ±5%     |  | 951477                      | 14VJ-471              |
| R53            | Carbon film    | 150     | 1/2W | ±10%    |  |                             | 12TK-151              |
| R54            | Carbon film    | 5.6K    | 1/4W | ±5%     |  | 951645                      | 14VJ-472              |
| R55            | Carbon film    | 2.2K    | 1/4W | ±5%     |  | 951589                      | 14VJ-222              |
| R56            | Carbon film    | 4.7K    | 1/4W | ±5%     |  | 951645                      | 14VJ-472              |
| R57            | Not used       |         |      |         |  |                             |                       |
| R58            | Carbon film    | 150K    | 1/4W | ±5%     |  | 951897                      | 14VJ-154              |
| SEMICONDUCTORS |                |         |      |         |  |                             |                       |
| Q1             | Transistor     | Silicon |      | Toshiba |  | 992108                      | 2SC784 (R)            |

\* Not in 1605DL



| Ref. No.                   | Description                        |           |         | h a n d i c<br>Stock Number | MFR'S<br>Parts Number |
|----------------------------|------------------------------------|-----------|---------|-----------------------------|-----------------------|
| Q2                         | Transistor                         | Silicon   | Toshiba | 992052                      | 2SC372 (O)            |
| Q3                         | Transistor                         | Silicon   | Toshiba | 992059                      | 2SC372 (Y)            |
| Q4                         | Transistor                         | Silicon   | Toshiba | 992059                      | 2SC372 (Y)            |
| Q5                         | Transistor                         | Silicon   | Toshiba | 992052                      | 2SC372 (O)            |
| Q6                         | Transistor                         | Silicon   | Toshiba | 992066                      | 2SC373                |
| Q7                         | Transistor                         | Silicon   | Toshiba | 992066                      | 2SC373                |
| Q8                         | Transistor                         | Silicon   | Toshiba | 992066                      | 2SC373                |
| Q9                         | Transistor                         | Silicon   | SONY    | 992129                      | 2SC1364               |
| Q10                        | Transistor                         | Silicon   | SONY    | 992129                      | 2SC1364               |
| Q11                        | Transistor                         | Silicon   | SONY    |                             | 2SC1728               |
| Q12                        | * Transistor                       | Silicon   | SONY    |                             | 2SC1816               |
| D1                         | Diode                              | Silicon   |         | 992150                      | 1S1555                |
| D2                         | Diode                              | Silicon   |         | 992150                      | 1S1555                |
| D3                         | Diode                              | Germanium |         | 992143                      | 1N60                  |
| D4                         | Diode                              | Germanium |         | 992143                      | 1N60                  |
| D5                         | Diode                              | Germanium |         | 992143                      | 1N60                  |
| D6                         | Diode                              | Zener     |         |                             | EQA01-05 (S)          |
| D7                         | Diode                              | Germanium |         | 992143                      | 1N60                  |
| D8                         | Diode                              | Germanium |         | 992143                      | 1N60                  |
| D9                         | Diode                              | Silicon   |         | 992164                      | HV80                  |
| D10                        | Diode                              | Silicon   |         | 992171                      | S1B01-02              |
| D11                        | Diode                              | Silicon   |         | 992171                      | S1B01-02              |
| D12                        | Diode                              | Zener     |         |                             | EQA01-09 (R)          |
| D13                        | Diode                              | Silicon   |         | 992171                      | S1B01-02              |
| D14                        | Diode                              | Germanium |         | 992143                      | 1N60                  |
| D15                        | Diode                              | Germanium |         | 992143                      | 1N60                  |
| TH-1                       | Thermistor                         |           |         | 992213                      | M-10K                 |
| IC-1                       | Audio amplifier integrated circuit |           |         |                             | HA-1339               |
| COILS/TRANSFORMERS/FILTERS |                                    |           |         |                             |                       |
| T1                         | ANT. coil                          |           |         | 995108                      | 74XN2229A0            |
| T2                         | RF coil                            |           |         | 995045                      | 1624B                 |
| T3                         | IF coil                            |           |         |                             | 7MC-452203N9          |
| T4                         | IF coil                            |           |         | 995059                      | 4202                  |
| T5                         | Output transformer                 |           |         |                             | AE-5254B              |
| T6                         | OSC coil                           |           |         | 995122                      | 8SNC-055              |
| T7                         | Drive coil                         |           |         | 995115                      | 8SND-061              |
| L1                         | RFC 2.2mH                          |           |         |                             | EL0610-222K           |
| L2                         | RFC 2.2μH                          |           |         | 995010                      | LF4-2R2K              |
| L3                         | RFC                                |           |         | 995087                      | 4LNC-092              |
| L4                         | RFC 10μH                           |           |         | 995094                      | LF1-100K              |
| L5                         | RFC 10μH                           |           |         | 995094                      | LF1-100K              |
| L6                         | Not used                           |           |         |                             |                       |
| L7                         | RFC                                |           |         | 995017                      | 4LNC-027              |
| L8                         | T NET coil                         |           |         | 995080                      | 8SNF-057              |
| L9                         | π NET coil                         |           |         | 995031                      | 10PNP-028             |
| L10                        | RFC                                |           |         | 995017                      | 4LNC-027              |
| L11                        | RFC                                |           |         | 995087                      | 4LNC-092              |

| Ref No.       | Description                    | h a n d i c<br>Stock Number | MFR'S<br>Parts Number |
|---------------|--------------------------------|-----------------------------|-----------------------|
| L12           | RFC                            | 995017                      | 4LNC-027              |
| L13           | RFC                            |                             | 8LNC-053              |
| L14           | Not used                       |                             |                       |
| L15           | RFC 10 $\mu$ H                 | 995094                      | LF1-100K              |
| L16           | RFC 10 $\mu$ H                 | 995094                      | LF1-100K              |
| CF-1          | Ceramic filter                 |                             | LF-B6                 |
| CF-2          | Ceramic filter                 |                             | EFA8 or BFB455L       |
| VOLUMES       |                                |                             |                       |
| VR1           | Volume control 50K (A)         |                             | V12M4-1S-20FH<br>A50K |
| VR2           | Squelch control 50K (C)        |                             | V12M-1N-20FH<br>C50K  |
| VR3           | Potentiometer 22K              |                             | P6S2X 22K             |
| VR4           | Potentiometer 4.7K             |                             | P6S2X 4.7K            |
| VR5           | Potentiometer 22K              |                             | P6S2X 22K             |
| SWITCHES      |                                |                             |                       |
| SW.1          | CH. switch                     |                             | S18-1-2-6-20L         |
| SW.2          | P.T.T. switch                  |                             | 2P-012                |
| CRYSTALS      |                                |                             |                       |
| RX            | Crystal 26.680 MHz             |                             |                       |
| TX            | Crystal 27.135 MHz             |                             |                       |
| MISCELLANEOUS |                                |                             |                       |
|               | Panel                          | 599519                      | GE-21D-5616           |
|               | Escutcheon assembly            |                             |                       |
|               | Cabinet                        |                             | GE-19B-4649           |
|               | Chassis                        |                             |                       |
|               | Heat sink                      |                             | GE-19D-4751           |
|               | Car mounting bracket           |                             | GE-20D-5275           |
|               | Car mounting bracket screw     |                             | GE-16D-3166           |
|               | VOLUME knob                    | 599554                      | GE-19D-4652           |
|               | Speaker cloth                  | 599568                      | GE-19D-4662           |
|               | MIC. case                      | 599575                      | GE-19D-4656           |
|               | MIC. holder                    |                             | GE-18D-4452           |
|               | MIC. cord                      |                             | GE-17D-3521           |
|               | MIC. knob                      | 599603                      | GE-19D-4657           |
|               | MIC. label A                   | 599610                      | GE-19D-4785 (A)       |
|               | MIC. label B                   | 599617                      | GE-19D-4785 (B)       |
|               | MIC. switch holder             | 599624                      | GE-19D-4661           |
|               | MIC. element                   | 599589                      | UD-11                 |
|               | P.C. board                     |                             | GE-21B-5657           |
|               | Pilot lamp 7V/50mA L = 190 mm. |                             |                       |
|               | Pilot lamp holder              |                             | LH-141                |
|               | Meter                          |                             | KL-249A-27            |

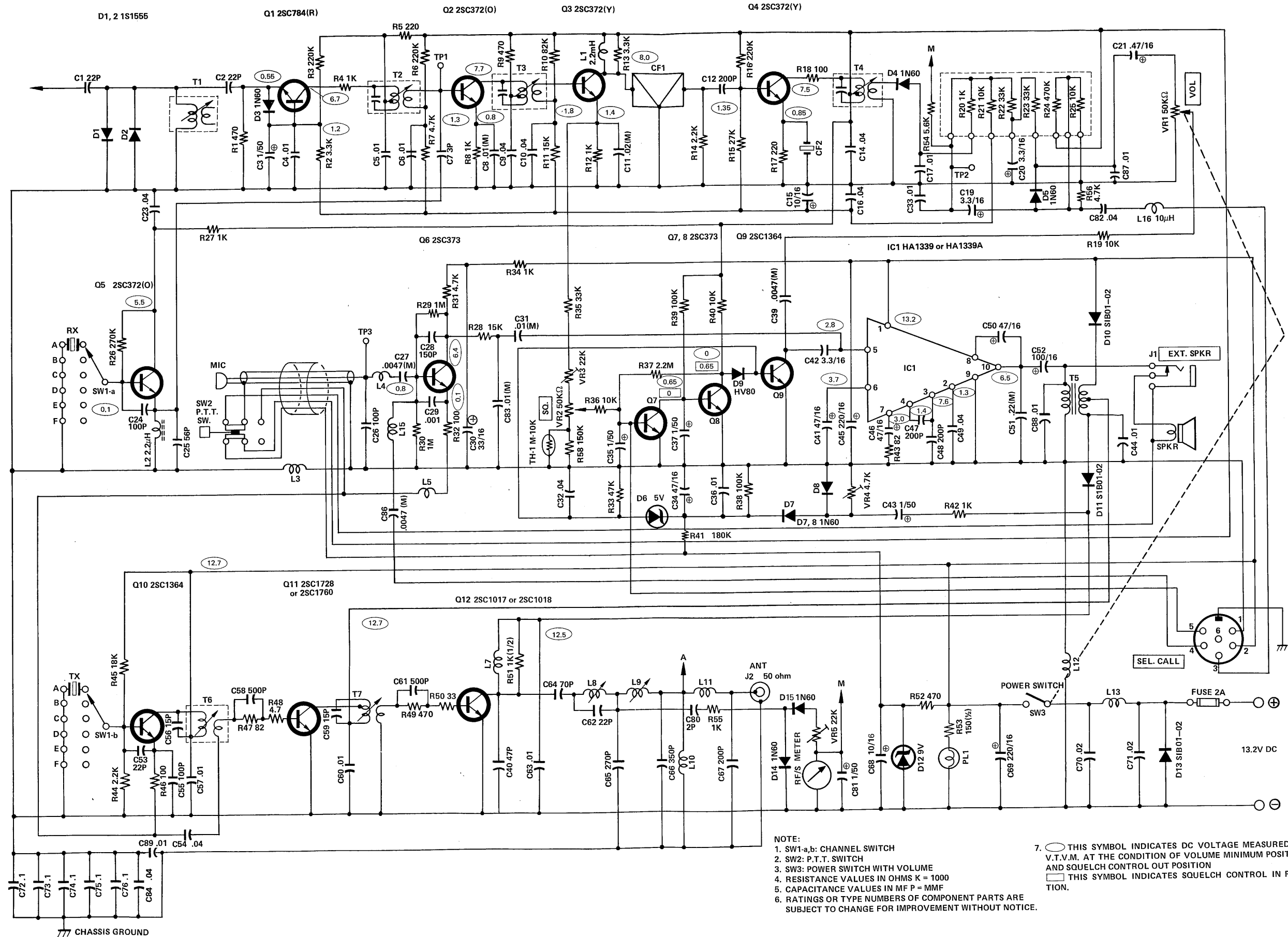
| Ref. No. | Description              | h a n d i c<br>Stock Number | MFR'S<br>Parts Number |
|----------|--------------------------|-----------------------------|-----------------------|
|          | ANT. connector           | 599428                      | NY-R                  |
|          | DIN. jack                |                             | D6-701B-00            |
|          | Speaker jack             | 599652                      | SJ-296-1-15           |
|          | Crystal socket           |                             | SB-101B-10            |
|          | Speaker 2-1/4", 16Ω      |                             | C060A10N1311          |
|          | Fuse 2A                  |                             |                       |
|          | DC. cord (W/Fuse) holder |                             |                       |
|          | Cord stopper             | 599659                      | SR-3P-4               |
|          | ANT. earth lug           |                             | GE-21D-6137           |
|          | Model label (605DL)      |                             |                       |
|          | IC mount bracket         |                             | GE-20D-5312           |
|          | Speaker holder           |                             | GE-19D-4607           |
|          | P.C.B. spacer            |                             | GE-19D-4789           |
|          | CH switch knob           | 599043                      | GE-19D-4631           |
|          | Poly case                |                             | GE-19B-4660           |

Following parts must be used in h a n d i c 1605DL.  
Other parts are same as h a n d i c 605DL.

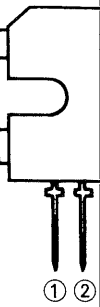
|                      | Description                     | h a n d i c<br>Stock Number | MFR'S<br>Parts Number |
|----------------------|---------------------------------|-----------------------------|-----------------------|
| <b>CAPACITORS</b>    |                                 |                             |                       |
| C25                  | Ceramic 56PF 50WV ±10%          |                             | FC-70                 |
| C40                  | Ceramic 47PF 50WV ±20%          | 990274                      | FC-60                 |
| C59                  | Ceramic 15PF 50WV ±10%          | 990246                      | FC-50                 |
| C65                  | Ceramic 270PF 50WV ±20%         | 990337                      | FC-90                 |
| C66                  | Ceramic 350PF 50WV ±20%         | 990358                      | FC-100                |
| C67                  | Ceramic 200PF 50WV ±20%         |                             | FC-80                 |
| C77                  | Not used                        |                             |                       |
| C78                  | Not used                        |                             |                       |
| C84                  | Ceramic 0.04μF 25WV -20±80%     | 990491                      | MC-100                |
| <b>RESISTORS</b>     |                                 |                             |                       |
| R26                  | Carbon film 270K 1/4W ±5%       | 951925                      | 14VJ-224              |
| R49                  | Carbon film 470 1/4W ±5%        | 951477                      | 14VJ-471              |
| R50                  | Carbon film 33 1/4W ±5%         | 951309                      | 14VJ-470              |
| R55                  | Carbon film 1K 1/4W ±5%         | 951533                      | 14VJ-102              |
| <b>SEMICONDUCTOR</b> |                                 |                             |                       |
| Q12                  | Transistor Silicon MITSUBISHI   | 992122                      | 2SC1017 or<br>2SC1018 |
| <b>MISCELLANEOUS</b> |                                 |                             |                       |
|                      | Model label (1605DL)<br>Cabinet |                             |                       |

2SC1017 or  
2SC1018

# SCHEMATIC DIAGRAM 1605DL



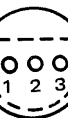
LINEAR



SEMIC

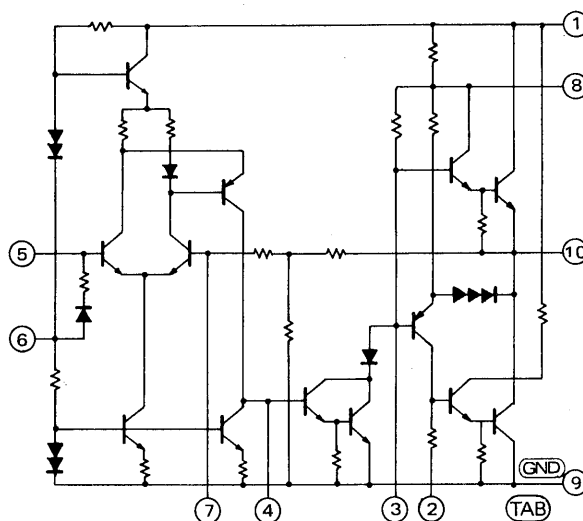
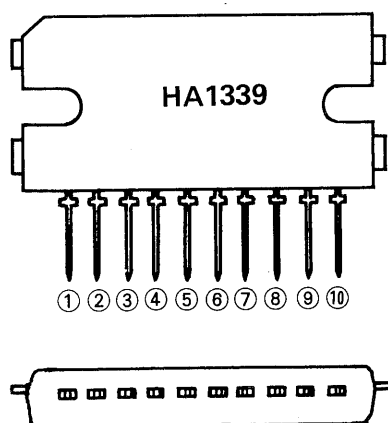
(A): 2SC372  
(B): 2SC1728  
(C): 2SC1828  
(D): 2SC1364  
(E): 2SC1017

(A)



1. EMITTER  
2. COLLECTOR  
3. BASE

# LINEAR INTEGRATED CIRCUIT HA1339



## SEMICONDUCTORS LEAD IDENTIFICATIONS

- (A): 2SC372 (O), 2SC372 (Y), 2SC373, 2SC784  
 (B): 2SC1728  
 (C): 2SC1816  
 (D): 2SC1364  
 (E): 2SC1017, 2SC1018

