

Philips - TMC

PHILIPS TELECOMMUNICATIONS MANUFACTURING COMPANY LIMITED

LINK INTERFACE UNIT

TYPE LIU3

Publication No. 9585 667 05982

November, 1980

This handbook is for the maintenance of telecommunication equipment. The performance figures quoted are typical and are subject to normal manufacturing and service tolerances. The right is reserved to alter the equipment or specifications in the light of future technical development.

This publication is copyright and no part may be reproduced or copied without the prior permission of Philips Telecommunications Manufacturing Company Limited.

Radio Communication Division,
Head Office and Factory,
Clarinda Road, Clayton,
Melbourne, Victoria, Australia.

Postal Address,
P.O. Box 105, Clayton,
Victoria, Australia 3168.

Telex AA 31881
Telephone 544 0366
Telegrams "Philtelcom" Melbourne

SECTION 1. SYSTEM DESCRIPTION

1.1. INTRODUCTION

The Link Interface Unit, LIU3, is an interface panel used to combine VHF and UHF transmitters and receivers to provide a wide variety of narrow band repeater and link configurations.

The unit is primarily intended to operate in conjunction with the FM814 VHF and FM815 UHF series base stations and follows the same 19" rack mount format occupying two rack units (3 1/2").

The front panel houses a level meter and switch which allows audio levels 'in' and 'out' from the connected bases to be measured. Two 'Banana-plug' sockets on the front panel provide a buffered output for monitoring the selected metering points.

Audio isolation between radio units is achieved using 600Ω balanced line transformers. The LIU3 is fitted with 6 pin "Preh" P.C.B. mounted sockets to minimize on the amount of internal wiring. However, the bulk of the socket connections have series wired links, mounted between pins, to allow sockets to be wired to suit any pin arrangement that other types of equipment may require.

1.2. LIU3/FM814/FM815 CONFIGURATIONS

The LIU3 P.C.B. is designed to cater for a full "party-line" system where all four inputs are directed to all four outputs with independent level controls in each path. Any audio paths not required are simply removed by cutting out the relevant wired links mounted between pins on the board.

A number of different configurations can be readily achieved using FM814/815's in conjunction with the LIU3 panel. These are as follows:-

1.2.1. BACK-TO-BACK LINK ON LINK CONTROLLED BASES (DIAG. 1).

- | | | | | |
|-----|----------------------------------|-------------|--------------------------------|---------------------|
| (a) | FM814 (or FM815) Simplex Station | to | FM815 (or 814) Simplex Station | |
| (b) | " | " | " | Duplex " |
| (c) | " | " | " | Talkthrough Station |
| (d) | " | Duplex | " | Duplex Station |
| (e) | " | " | " | Talkthrough Station |
| (f) | " | Talkthrough | " | Talkthrough Station |
- with or without the tone squelch decoder option.

1.2.2. BACK-TO-BACK LINK WITH LINE ACCESS (DIAG. 2)

The LIU3 panel enables all of the configurations listed in section 1.2.1. above to be provided with line access as well.

1.2.3. BACK-TO-BACK LINK WITH A SPUR AND LINE ACCESS (DIAG. 3).

The LIU3 panel also enables all of the configurations listed in section 1.2.1. to be provided with a "Spur" Tx/Rx as well as the Line Access Option.

1.2.4. STANDARDISED LEVELS BETWEEN LIU3 AND FM814/5.

The FM814-5/LIU3 System is designed to have specified interface audio levels between the base equipment and the LIU3 panel assembly. This feature increases system flexibility and helps minimise service time and system 'down-time' in the field because a faulty item of equipment (eg. Rx, Tx or LIU3) can simply be replaced by a pre-aligned spare. In this way there is no on site alignment required.

1.2.5. STANDARD PRODUCED LIU3 MODEL

While the LIU3 can be configured for several different system arrangements as listed above, the LIU3 documentation is based on a simplex Back-to-back FM814 (or FM815) system with line access.

1.3. METERING FUNCTIONS

The meter on the front panel can display any one of the four audio inputs and four audio outputs at a given time. The rotary switch allows selection of a given monitoring point which is then directed to the meter display circuit. Each monitoring path has an adjustment trimpot to allow calibration with the meter. Full scale deflection indicates 5KHz deviation levels. The selected audio is also directed via a buffer amplifier to the two monitoring terminals on the front panel which can be used for servicing purposes.

The rotary switch has provision for indicating two R.F. levels from two respective FM814/815 transmitters. This feature makes use of a D.C. monitoring point, within the FM814 (or FM815) transmitter, which is proportioned to the R.F. power. Once again, separate trimpots are provided within the LIU3 panel to allow calibration of the meter. Full scale deflection indicates 100 watts.

1.4. MODS TO 814 MK 2 AND 815 MK 3 WITH T3 AUDIO FACILITIES BOARD

- (a) Link Pin 45 to 61 on Tx Aud. Fac. Bd.
- (b) Cut out diode D11 on Tx Aud. Fac. Bd.
- (c) Cut out R50 on Tx Aud. Fac. Bd.
- (d) Connect pin 40 of control Bd. to Tx Aud. Fac. Bd. pin 58.
- (e) Remove shielded cable from pins 30 and 31 of Tx AFB and connect to pins 56 and 57 respectively.
- (f) Remove wire to pin 15 on exciter and connect to pin 30.
- (g) Add R99 (1 Ω), R119 (100k Horizontal Pot), R120 (22k) and remove R108 from Exciter Board.
- (h) (i) For Simplex Operation Link pin 29 to 30 on Rx A.F. B.
(ii) For Talk Through Operation Link pin 28 to 30 on Rx A.F. B.
- (i) Link pin 40 to 42 on Rx A.F. B.
- (j) Insert diode in series with R7 of Tx A.F. B. Remove wire from pin 22 of Tx A.F. B. (The wire to Pin 55) and connect to the junction of R7 and the diode.

DIAGRAM 1.

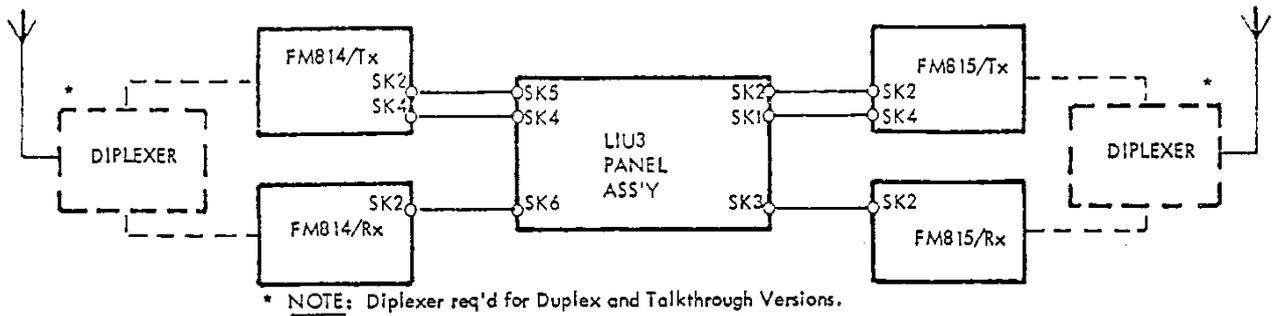


DIAGRAM 2.

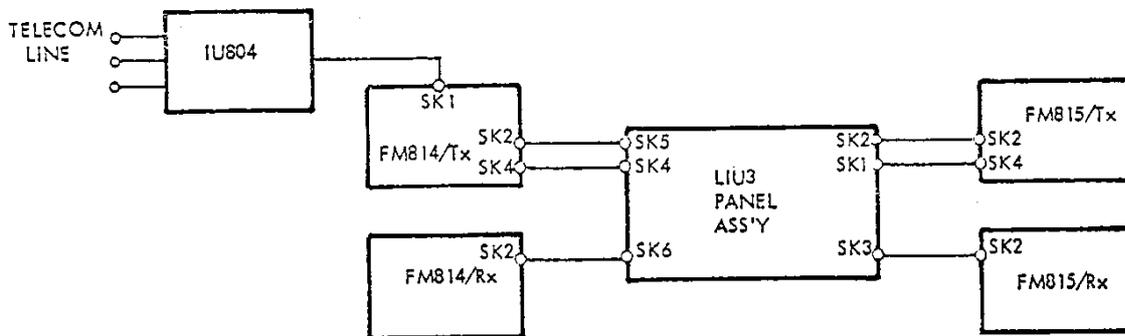
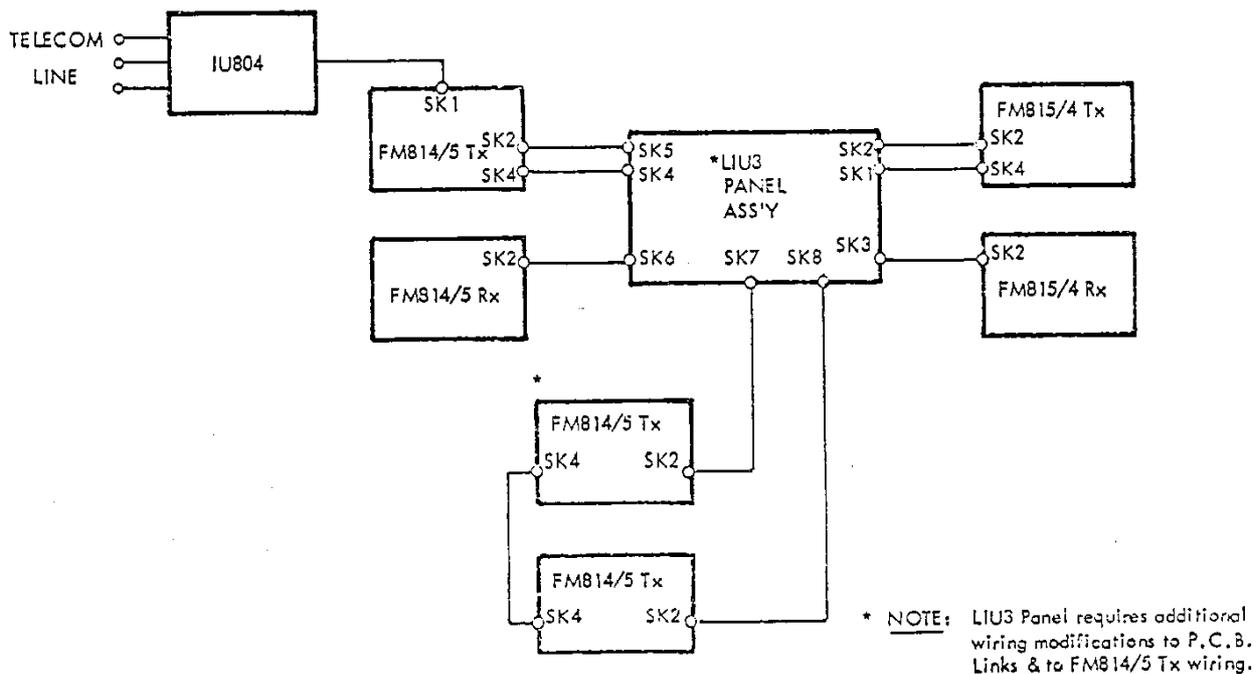
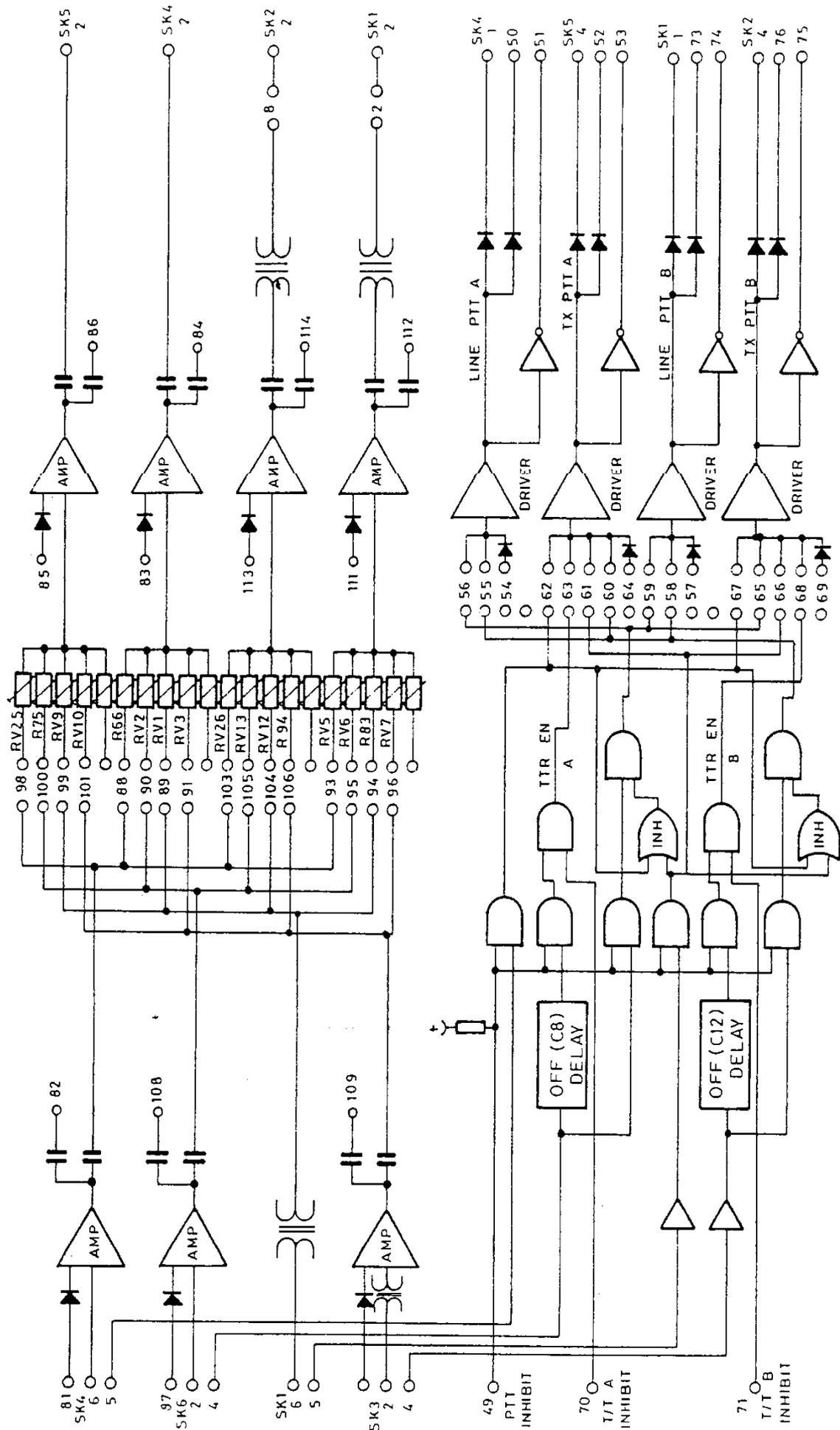
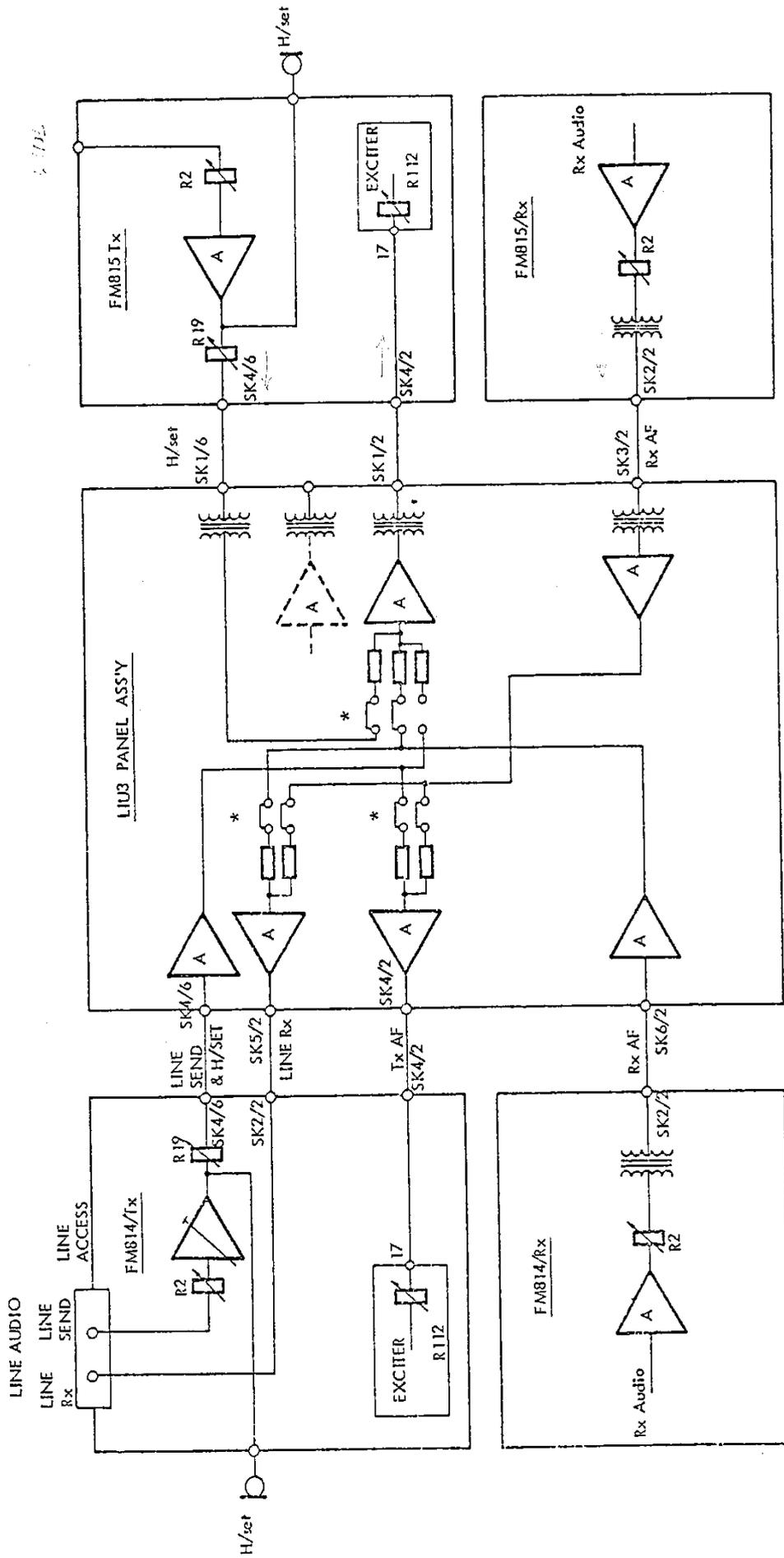


DIAGRAM 3.





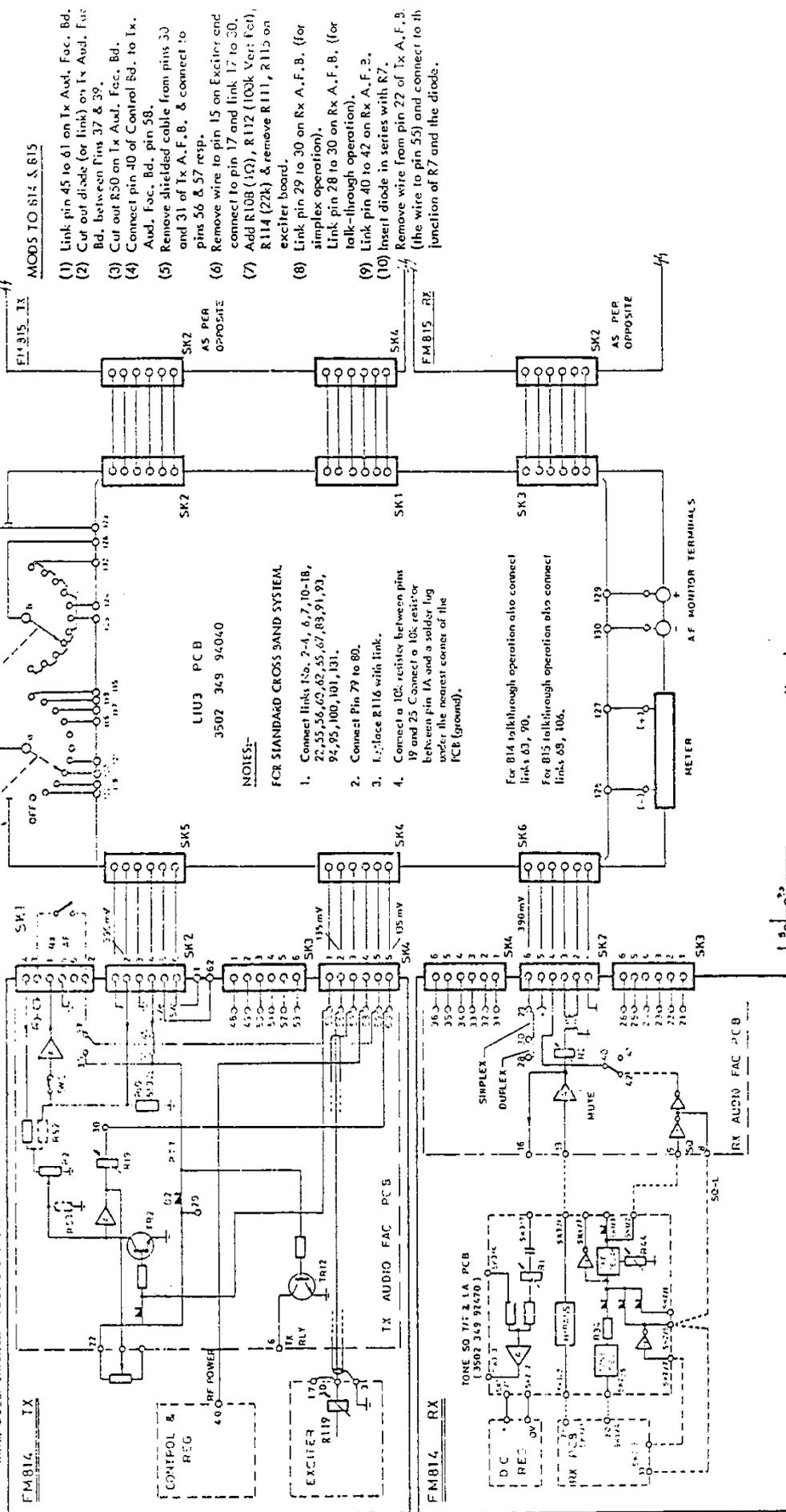
LIU3 PC.B.
BLOCK SCHEMATIC



* NOTE: LINKS REMOVED IF LINE ACCESS IS NOT REQUIRED

SIGNAL FLOW DIAGRAM OF SIMPLEX FM814/5
BACK-TO-BACK WITH LINE ACCESS LIU3 SYSTEM

Note: For tone squelch option add in dotted connections
Refer Documentation - 9505 215 81873



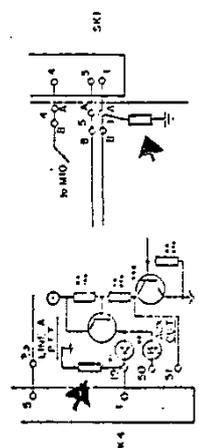
MODS TO 814 & 815

- (1) Link pin 45 to 61 on Tx Aud. Fac. Bd. Cut out diode (or link) on Tx Aud. Fac Bd. between pins 37 & 39.
- (2) Cut out R50 on Tx Aud. Fac. Bd.
- (3) Connect pin 40 of Control Bd. to Tx. Aud. Fac. Bd. pin 58.
- (4) Remove shielded cable from pins 30 and 31 of Tx A. F. B. & connect to pins 56 & 57 resp.
- (5) Remove wire to pin 15 on Exciter and connect to pin 17 and link 17 to 30.
- (6) Add R108 (10K), R112 (100K Vert. Volt), R114 (22k) & remove R111, R115 on exciter board.
- (7) Link pin 29 to 30 on Rx A. F. B. (for simplex operation).
- (8) Link pin 28 to 30 on Rx A. F. B. (for talk-through operation).
- (9) Link pin 40 to 42 on Rx A. F. B.
- (10) Insert diode in series with R7. Remove wire from pin 22 of Tx A. F. B. (the wire to pin 55) and connect to the junction of R7 and the diode.

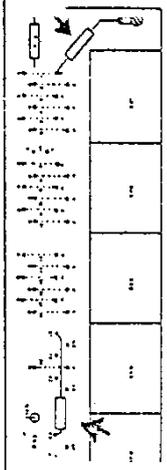
NOTES:-

- FOR STANDARD CROSS BAND SYSTEM**
1. Connect links Nos. 7-4, 6, 7, 10-18, 22, 25, 26, 62, 62, 65, 67, 83, 91, 93, 94, 95, 100, 101, 131.
 2. Connect Pin 79 to 80.
 3. Place R116 with link.
 4. Connect a 10K resistor between pins 19 and 25. Connect a 10K resistor between pin 1A and a solder lug under the nearest corner of the PCB (ground).

For B14 talkthrough operation also connect links 63, 90.
For B15 talkthrough operation also connect links 69, 106.



Circuit Scraps Showing 10K Resistors (See Note 4)



PCB Scrap Showing 10K Resistors (See Note 4)

INTERCONNECTION DIAGRAM
LIU3: FM814/815 BACK-TO-BACK LINK
WITH LINE ACCESS

SECTION 2. SYSTEM ALIGNMENT

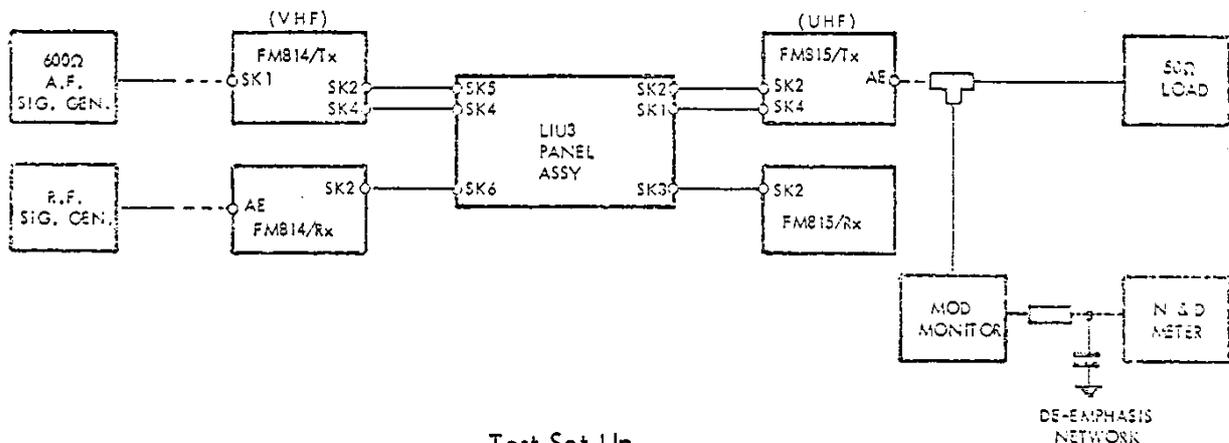
FM814/815 BACK-TO-BACK (SIMPLEX) LINK WITH LINE ACCESS

2.1. GENERAL

This system consists of an FM814 (VHF) and FM815 (UHF) that are crossbanded via an LIU3 unit and having provision for Line Access. Prior to system testing all equipment should be connected and modified according to the "LIU3: FM814/815 Back-to-Back Link with Line Access Interconnection Diagram".

The LIU3 panel is aligned with the FM814/815 series so as to allow panel replacement without having to re-align the replacement panel (accuracy to within $\pm 1.5\text{dB}$.)

2.2. FM814 Rx to FM815 Tx



Test Set Up

- Check the receiver (Rx) crystal frequency netting using a 10.7MHz marker.
- Check the transmitter (Tx) frequency.
- Check that the transmitter power measures between 40W and 50 Watts.
- Set the R.F. signal generator to 1kHz/ $\pm 3\text{kHz}$ deviation and 1mV and adjust the Rx "Line O/P" pot. (R2) for a level of 390mV RMS at the Rx output (measure at pin 32 on LIU3 p.c. board.)
- Select "VHF Rx" on the LIU3 panel and adjust RV20 to read "60" on the LIU3 meter.
- Adjust RV6 for 135mV RMS at pin 2 on LIU3 p.c.b. (for FM815 Tx).
- Adjust trimpot, R119, on Tx Exciter board for a deviation output of $\pm 3\text{kHz}$.
- Select "UHF Tx" on the LIU3 panel and adjust RV16 to read "60" on the meter.
- Select "UHF RF" on the LIU3 and adjust RV23 to read the measured RF watts on the meter.
- Set the R.F. sig. gen. to 1kHz/ $\pm 3\text{kHz}$ and 0.5uV and check that the SINAD figure at the Rx output (measure at pin 32 on LIU3 p.c.b) is better than 18dB.

- (k) Increase the R.F. sig. gen. output to 1mV.
- (l) Check that the distortion measured at the output of the Modulation Monitor, after de-emphasis, is better than 5%.
- (m) Check that the FM814 Rx to FM815 Tx path signal-to-noise ratio is better than 40dB relative to 1kHz/±3kHz (measured at Mod. Mon. output without de-emphasis).
- (n) Set the R.F. sig. gen. to 1kHz/±0.5 kHz (to prevent clipping) and set the N & D meter at the output of the Mod. Mon. to 0dB reference. Do not use de-emphasis network.
- (o) Check that the N & D meter reads between 0 and -4dB at 300Hz.
- (p) Check that the N & D meter reads between 0 and -3dB at 3000Hz.

2.3. FM815 Rx to FM814 Tx

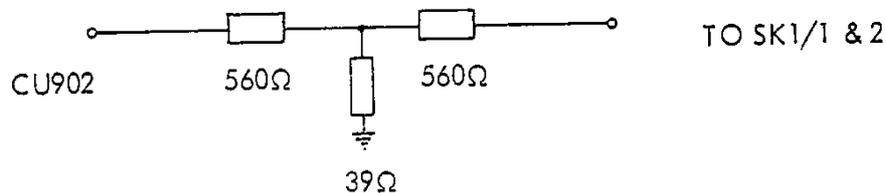
- (a) Check the Rx crystal frequency netting using a 10.7MHz marker.
- (b) Check the Tx frequency.
- (c) Check that the Tx power measures 50 ± 1 watt.
- (d) Set the R.F. sig. gen. to 1kHz/±3kHz and 1mV and adjust the Rx "Line O/P" pot. (R2) for a level of 390mV RMS at the Rx output (measure across pin 14 and pin 15 on LIU3 pcb).
- (e) Select "UHF Rx" on the LIU3 panel and adjust RV17 to read "60" on the meter.
- (f) Adjust RV3 for 135mV RMS at pin 20 on LIU3 board.
- (g) Adjust trimpot, R112, on Tx Exciter board for a deviation output of ±3 kHz.
- (h) Select "VHF Tx" on the LIU3 panel and adjust RV21 to read "60" on the meter.
- (i) Select "VHF RF" on the LIU3 and adjust RV24 to read the measured R.F. output on the meter directly.
- (j) Set the R.F. sig. gen. to 1kHz/±3kHz and 0.5uV and check that the SINAD figure at the Rx output (measure across pin 14 and pin 15 on LIU3 panel) is better than 18dB.
- (k) Increase the R.F. sig. gen. output to 1mV.
- (l) Check that the distortion measure at the output of the Modulation Meter, after de-emphasis, is better than 5%.
- (m) Check that the FM815 Rx to FM814 Tx S/N ratio is better than 40dB relative to 1kHz/±3kHz (measured at the Mod. Mon. output without de-emphasis).
- (n) Set the R.F. sig. gen. to 1kHz/±0.5 kHz (to prevent clipping) and set the N & D meter at the output of the Mod. Mon. to 0dB reference. Do not use de-emphasis network.
- (o) Check that the N & D meter reads between 0 and -4dB at 300Hz.
- (p) Check that the N & D meter reads between 0 and -3dB at 3000Hz.

2.4. LINE INPUT TO FM814 Tx (and FM814 HANDSET)

- (a) Connect an A.F. sig. gen. 600Ω , across the line input (i.e. across SK1/1 and SK1/2 (0V) on the FM814 Tx) and connect an AV0 (2.5V range between pin 70 and 0V Tx audio facilities board (A.F.B).
- (b) Set the A.F. sig. gen. to 1kHz and -30dBm and adjust the "Line I/P level" pot on the Tx so that the AV0 just rises to about 0.5V i.e. compression threshold.
- (c) Set the A.F. sig. gen. to -20dBm .
- (d) Adjust R19 for a level of 135mV RMS at pin 30 on the Tx A.F.B.
- (e) Select "Line in" on the LIU3 panel and adjust RV22 to read "60" on the meter.
- (f) Check whether the level at pin 20 on the LIU3 reads $135 \pm 20\text{mV}$ RMS. If not, add a select-on-test (S.O.T) resistor in place of link 88 to obtain this level. This should cause the FM814 Tx to deviate at $\pm 3.0\text{kHz}$ at 1kHz.
- (g) Operate FM814 handset and check that the FM814 Tx deviates between 3.0 and 5 kHz on voice.

NOTE The rest of this section may be omitted if Line Access is not required

- (h) Activate line P.T.T. This is best done by using a CU902 with the 2.5kHz PTT tone set for -10dBm at the CU902 line output and an audio signal generator (600Ω unterminated) connected to the aux. Tx AF input of the CU902 set to give an output level measured at the CU902 line output of 0dBm at 1kHz. A 30dB attenuator must be provided on the line output of the CU902 to be able to set $\pm 3\text{kHz}$ deviation. The simple resistive network shown below can be switched in or out as required.



- (i) Check that the Line-to-FM814 Tx S/N ratio is better than 40dB relative to $1\text{kHz}/\pm 3\text{kHz}$ (i.e. -20dBm on the line). Measure without de-emphasis network.
- (j) Set the A.F. sig. gen. to 1kHz and reduce the A.F. sig. gen. output level to give a deviation of $\pm 0.5\text{kHz}$ (to prevent clipping).
- (k) Connect the N & D meter to the output of the Modulation Monitor. Do not use the de-emphasis network.
- (l) Operate P.T.T. and set the N & D meter to 0dB reference
- (m) Adjust the A.F. sig. gen. to 300Hz. The N & D meter level should read between -14.5 and -18.5dB .
- (n) Adjust the A.F. sig. gen. to 3000Hz. The N & D meter should read between $+6.5\text{dB}$ and $+10.5\text{dB}$.

2.5. LINE INPUT TO FM815 Tx (and FM815 HANDSET)

- (a) Connect the A.F. sig. gen. connected across the line input, SK1/4 and SK1/6 (0V), of the FM815 Tx and set it to 1kHz and -20dBm.
- (b) Adjust R19 for a level of 135mV RMS at pin 30 on the FM815 Tx A.F.B.
- (c) Disconnect the A.F. sig. gen.
- (d) Connect the handset FM815 Tx and check its operation. Normal voice should cause the FM815 Tx to deviate between 3.0 and 5.0KHz. (If not, add a S.O.T. resistor in place of link 94 or R83 as required.

NOTE. The rest of this section is only required for the Line Access option.

- (e) Connect the A.F. sig. gen. across the system line input i.e. to SK1/4 and SK1/6 (0V) on the FM814 Tx
- (f) Set the A.F. sig. gen. to 1kHz and -20dBm and adjust RV5 for ± 3 kHz deviation from the FM815 Tx. (Double check that the meter reads "60" in both the "Line In" and "UHF Tx" positions").
- (g) Check that the distortion as measured at the output of the N & D meter is better than 3%.
- (h) Check that the S/N ratio is better than 40dB.
- (i) Reduce the A.F. sig. gen. to give ± 0.5 kHz deviation and set the N & D meter to 0dB reference.
- (j) Adjust the A.F. sig. gen. to 300Hz. The N & D meter level should read between -9.5 to -13.5dB.
- (k) Adjust the A.F. sig. gen. to 3000Hz. The N & D meter level should read between +6.5 to +10.5dB.

2.6. FM815 Rx to LINE

- (a) Connect the R.F. sig. gen. to the FM815 Rx and set it to 1kHz/ ± 3 kHz and 1mV.
- (b) Adjust RV10 for a level of 390mV RMS at pin 26 on the LIU3 board.
- (c) Select "Line out" on the LIU3 panel and adjust RV19 (LIU3 p.c.b) to read "60" on the meter.
- (d) Check that the level across the line (SK1/1 and 0V on the FM814 Tx) measures between 0 and -4dBm, with the line terminated with 600 Ω .
- (e) Check that the distortion across the line is better than 3%.
- (f) Check that the S/N is better than 40dB.

2.7. FM814 Rx to LINE

- (a) Connect the R.F. sig. gen. to the FM814 Rx and set it to 1kHz/ ± 3 kHz and 1mV.

- (b) Measure the level at pin 26 and if it is not $390 \pm 50\text{mV RMS}$, add a S.O.T. resistor in place of link 100 or R75 as required.
- (c) Check that the distortion across the line is better than 3%.
- (d) Check that the S/N is better than 40dB.

SECTION 3. LINK INTERFACE UNIT LIU3 PC BOARD

3.1. CIRCUIT DESCRIPTION

3.1.1. INTRODUCTION

The Link Interface Unit (LIU3) printed circuit board (PCB) is designed to cater for a full "party-line" system where all four inputs are directed to all four outputs with independent level controls in each path. Any audio paths not required are simply removed by cutting out the relevant wired links mounted between pins on the board.

3.1.2. DETAILED CIRCUIT DESCRIPTION

3.1.2.1. Power Supply Regulation

The circuit board contains a 10V regulator which is designed to operate from an input (SK5/5) voltage range of 10.8 to 16V. Regulation is achieved with TR5 (LM317) which has internal short circuit protection as well. The regulated output level is determined by the ratio of R17 and R18. The standby current consumption of the board is nominally 15mA.

3.1.2.2. Audio Path

There are four separate audio inputs and similarly four separate outputs. Two of the inputs and two of the outputs are provided with 600 Ω balanced line transformers (TF1 to TF4). The other two inputs and outputs normally connect to the same item of equipment from which the printed circuit board derives its power supply and the balanced line feature is not necessary.

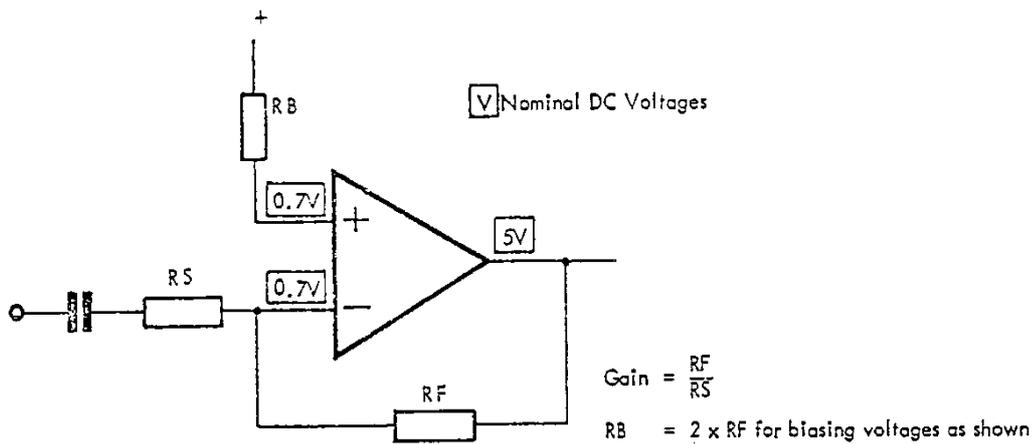
Three of the inputs, SK3/2, SK4/6 and SK6/2, are directed to buffer amplifiers, IC5/c, IC4/a and IC4/d.

The low impedance output of these buffer amplifiers enables each input source to be split into four directions without the problem of impedance interaction. Each path has a separate level adjustment (RV1 to RV14, RV25 to RV26). Each of these amplifiers has an auxiliary output at pins 109, 82 and 108 respectively.

The split paths are combined for each of the four outputs using summing amplifiers, IC5a, IC5b, IC4b and IC4c. Each of these amplifiers has an auxiliary input at pins 97, 107, 92 and 102 and auxiliary output at pins 112, 114, 84 and 86 respectively. The audio outputs leave the board from SK1/2, & 3, SK2/2 & 3, SK4/2 and SK5/2.

The fourth input, SK1/6, has a balanced line transformer terminated with 600 Ω which is then split into four directions similar to the other inputs. Once again there is negligible interaction between the split paths due to the effective low source impedance (600 Ω).

The gain of all the eight amplifiers on the board are each determined by the ratio of the associated feedback resistor to the series resistor as shown in diagram on following page.



The inverting inputs to these amplifiers are bypassed with 68pF capacitors (C22, C40, C61 to C64) to eliminate high frequency "noise" which can arise in the presence of R.F.

An "inhibit" input is provided on each input and output amplifier. A high (nominally 10V) on an inhibit input (pins 81, 83, 85, 87, 111, 113 and 110) biases the associated amplifier "off", such that no audio appears at the output of the amplifier.

A very flexible range of audio path combinations are available by way of selection (or removal) of links 88 - 91, 93 - 96, 98 - 101 and 103 - 106.

3.1.2.3. Metering

The four audio inputs and four outputs are also directly fed to trimpots RV 15 to RV22 which are used to calibrate these levels to a 100uA meter scale. IC5d is the meter amplifier which directs the sampled audio (by means of an off-the-board switching arrangement) via full-wave rectifying bridge (D25 to D28) to the meter display. The output of the meter amplifier appears at pin 129 via a 680Ω resistor to enable external monitoring of the selected metered audio.

SK1/4 and SK4/4 are inputs that can be used in conjunction with FM814/815's to indicate the transmitter power level on the same meter associated with the audio metering facility described above. RV23 and RV24 allow calibration of these D.C. levels.

3.1.2.4. Squelch/Press-to-Talk (P.T.T) Paths

Squelch/P.T.T input and output logic is basically designed to work in conjunction with the audio circuitry.

As for the audio section, there are four separate inputs (SK1/5, SK3/4, SK4/5 and SK6/4) and four separate outputs (SK1/1, SK2/4, SK4/1 and SK5/4) which can source about 100mA each. Inputs and outputs are active high, although SK3/4 can be active low if link 78 to 80 is made instead of link 79 to 80. All outputs have two additional auxiliary outputs, one active high and the other active low. The active high outputs occur at pins 73, 76, 50, 52 and the active low outputs at pins 74, 75, 51, 53 respectively.

The four P.T.T. outputs themselves have an auxiliary input each (active high) at pins 57, 69, 54 and 64 respectively.

All four outputs are inhibited if pin 49 is shorted to 0V.

The incidence of squelch (i.e. high) at SK6/4 causes outputs at SK1/1, SK2/4 and SK4/1 to go active (high) so long as the input remains high. If either SK1/5 or SK4/5 go active (high) during this time the above outputs will immediately go low again. These latter inputs are designed for Line-access where line P.T.T. is often required to override other radio traffic.

The high at SK6/4 also causes SK5/4 to go active (high) so long as the "Talkthrough Inhibit A" input at pin 70 is not shorted to 0V. When the SK6/4 input returns to 0V, the output at SK5/4 remains high for about 5 seconds due to the time constant involved with C8 and R27. This feature is only required for talkthrough operation.

The Zener diode (D 10) is fitted for overvoltage protection of IC3a.

The incidence of squelch (i.e. high) at SK3/4 causes outputs at SK1/1, SK5/4 and SK4/1 to go active (high) in the exact same manner as the above case. In this instance, the latter outputs follow the input directly via IC2a and d, so long as the line PTT inputs (SK1/5 or SK4/5) do not go active. SK2/4 "hangs on" for about 5 seconds due to C 12 and R52. This talkthrough feature is inhibited if pin 71 is connected to 0V.

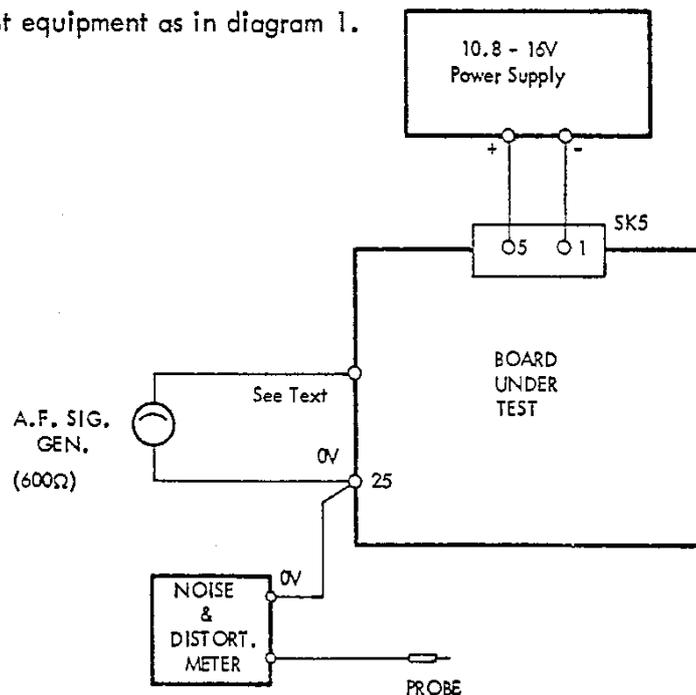
The incidence of a high at SK1/5 causes outputs SK2/4 and SK5/4 to go active.

The selection (or removal) of links 55, 56, 58 - 63, 63 - 68 can vary the above logical sequence of events as required.

3.2. ALIGNMENT

3.2.1. REGULATOR

(a) Set up test equipment as in diagram 1.



(b) Place AV0 between pin 133 (Regulator output) and 0V (pin 25).

(c) Vary the external power supply level between 10.8V and 16V and check that the AV0 does not vary by more than 0.1V between 8.9V and 10.6V.

3.2.2. INPUT AMPLIFIER IC4d TO OUTPUTS

- (a) Connect a 600Ω A.F. sig. gen. (300mV RMS output) to SK6/pin 2 and 3 (0V) as shown in diagram 3.3.1.a.
- (b) Connect a Noise and Distortion (N & D) meter to the same pins and calibrate the meter to read 0dB reference.
- (c) Use the N & D meter to check that levels appearing at output pins are within the specified tolerances as listed in table 1 at the frequencies indicated.

NOTE: The table also lists the links required to be made on the printed circuit board (p.c.b) to enable measurement of the respective outputs. It also lists the associated gain trimpots that should be adjusted for maximum output level before performing the test in each case.

TABLE 1:

Pin No.	Specified Output Level at 1KHz	Max Specified Degradation c.f. 1KHz		Links Required	Associated Gain Control Trimpot
		300Hz	3000Hz		
108	-2/+1dB	-	-	-	-
86	-3/+2dB	-	-	100	-
26	-3/+2dB	-1.5dB	-1.5dB	100	-
114	+13/+19dB	-	-	105	RV 13
8 & 9 (0V) (unterminated)	+13/+19dB	-1.5	-1.5	105	RV 13
84	-1/+4dB	-	-	90	RV2
20	-1/+4dB	-1.0	-1.0	90	RV2
112	+5/11dB	-	-	95	RV6
2 & 3 (0V) (unterminated)	+5/11dB	-1.5	-1.5	95	RV6

- (d) Connect the N & D Meter to pin 108 again and check that the level is attenuated by more than 40dB when pin 87 is connected to +ve (pin 133).
- (e) Disconnect the A.F. gen. from SK6/pin 2 and 3.

3.2.3. INPUT AMPLIFIER IC5c TO OUTPUTS

- (a) Connect the 600Ω A.F. sig. gen. (300mV RMS output) across SK3/pin 2 and 3. The N & D should still be set to indicate 0dB reference at 300mV RMS.
- (b) Use the N & D meter to check that the levels appearing at output pins are within the specified tolerances as listed in table 2 at the frequencies indicated. Make sure that links 8 & 9 are mounted on the board.

TABLE 2:

Pin No.	Specified Output Level at 1KHz	Max Specified Degradation c.f. 1KHz		Links Required	Associated Gain Control Trimpot
		300Hz	3000Hz		
109	-3/+1dB	-1.5dB	-1.5dB	-	-
26	8/13.5dB	-	-	101	RV10
20	-2/+4dB	-	-	91	RV3
114	+2/+7dB	-	-	106	-
112	+5/10dB	-	-	96	RV7

- (c) Connect pin 110 to +ve (pin 133) and check that the measured level at pin 109 is attenuated by 40dB or more.

3.2.4. INPUT AMPLIFIER IC4a TO OUTPUTS

- (a) Connect the 600Ω A.F. sig. gen. (300mV RMS) to SK4/pin 6 (or pin 24). The N & D meter should still be set to indicate 0dB reference at 300mV RMS.
- (b) Use the N & D meter to check that the levels appearing at output pins are within the specified tolerances as listed in table 3.

TABLE 3:

Pin No.	Specified Output Level at 1KHz	Max Specified Degradation c.f. 1KHz		Links Required	Associated Gain Control Trimpot
		300Hz	3000Hz		
82	-2/+1dB	-1.5dB	-1.5dB	-	-
26	+ 8/+13.5dB	-	-	98	RV25
20	-3/+2dB	-	-	88	-
114	+13/+19dB	-	-	103	RV26
112	+5/±10dB	-	-	93	RV5

- (c) Connect pin 81 to +ve (pin 133) and check that the measured level at pin 82 is attenuated by 40dB or more.

3.2.5. INPUT SK1/6 TO OUTPUTS

- (a) Connect the 600Ω A.F. sig. gen. (300mV RMS) across pins 6B and 131B. The N & D Meter should still be set to indicate 0dB reference at 300mV RMS.
- (b) Use the N & D meter to check that the levels appearing at output pins are within the specified tolerances as listed in table 4.

TABLE 4:

Pin No.	Specified Output Level at 1KHz	Max Specified Degradation c.f. 1KHz		Links Required	Associated Gain Control Trimpot
		300Hz	3000Hz		
26	+8/+12dB	-1.5dB	-1.5dB	99	RV9
20	-2/+3dB			89	RV1
114	+13/+18dB			104	RV12
112	-1/+3dB			94	-

3.2.6. AUXILIARY AUDIO INPUTS AND OUTPUT AMPLIFIER INHIBITS

- (a) Connect the 600Ω A.F. sig. gen. to the auxiliary input, reference the N & D meter to 0dB at 300mV RMS, adjust the input pot for maximum output and check that the auxiliary output is within the specified limits. Repeat this for each amplifier as listed in table 5.
- (b) Connect the Inhibit pin of the respective amplifiers to +ve (pin 133) and check that the respective outputs are attenuated by 40dB or more relative to the levels measured in (a) above. Refer to table 5.

TABLE 5:

Amplifier	Input		Pot Not.	Output		Inhibit Pin No.
	Pin No.	Level in (0dB ref)		Pin No.	Relative Level	
IC4/b	92	300mV RMS	RV4	84	0/+3dB	83
IC5/a	97	300mV RMS	RV8	112	+7/10dB	111
IC4/c	102	300mV RMS	RV11	86	+10/13dB	85
IC5/b	107	300mV RMS	RV14	114	+15/18dB	113

3.2.7. METER AMPLIFIER

- (a) Connect the A.F. sig. gen. (50mV RMS and 1KHz) to pin 123 via a 22K resistor.
- (b) Use the N & D meter (0dB reference set to 50mV RMS) to check that the output level at pin 129 reads between 25 and 32dB.
- (c) Repeat steps (a) and (b) for output pin 132.

3.2.8. SQUELCH INPUTS (D.C) TO PTT OUTPUTS (D.C)

- (a) There are four D.C. (squellch) inputs, which in each case, effect a number of D.C. outputs depending on the links fitted.

Connect +ve (pin 133) to an input and check that the outputs change to states as indicated in table 6.

NOTE: "L" indicates 0V to 0.2 and "H" indicates 10V \pm 1V.

- (b) Repeat section (a) for each of the four inputs listed in table 6.

TABLE 6:

INPUT PIN	ASSOCIATED LINK NO.	OUTPUT PIN	OUTPUT LEVEL	REMARKS		
SK6/pin 4 (or pin 34)	65	75	L	Goes L if pin 49 goes L.		
		76	H			
		10B	H			
	56	59	51	L	Goes L when pin 23 or pin 5B go	
			50	H		
			19	H		
	63	63	74	L		
			73	H		
			1B	H		
	SK4/pin 5 (or pin 23) SK1/pin 5 (or pin 5B)	62	53	*L	Goes L when pin 70 goes L.	
			52	*H		
		67	28	28		*H
10B				H		
5 & 61		5 & 66	72	H		Not inhibited if pin 49 goes L.
			28	H		
SK3/pin 4	68	76	H	Goes L when pin 71 goes L.		
		60	28		H	
	55	58	19	*H	Goes L when pin 23 or 5B go H.	
			1B	H		

NOTE: (1) All outputs in Table 6 should be inhibited if pin 49 is connected to 0V.

(2)* Outputs asterisked in table 6 should hang on for 3.8 to 6.5 seconds after the input voltage (+ve) is removed. If the time is greater than 6.5 seconds change the associated timing resistor (either R27 or R52) to 1M.

- (c) Connect +ve (pin 133) to an auxiliary input and check that the outputs change to states as indicated in table 7.

TABLE 7:

INPUT PIN	OUTPUT PIN	OUTPUT LEVEL
64	28	H
69	76	H
54	19	H
57	1B	H

3.2.9. METERING ADJUSTMENTS - TO BE CARRIED OUT AFTER BOARD TEST

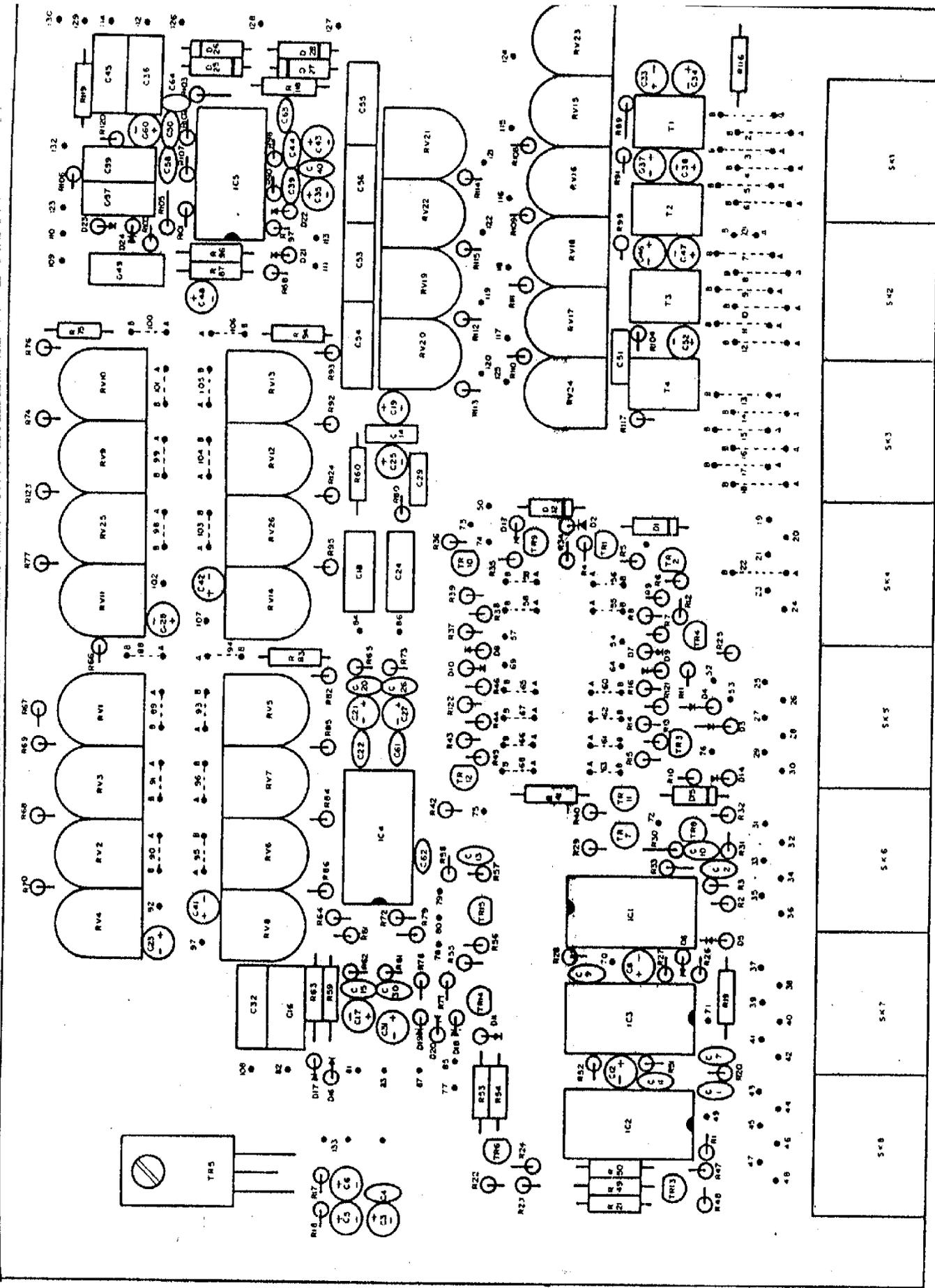
With the inputs and links as specified in the table below adjust:-

- (i) the output pots to obtain the specified output levels and
- (ii) the meter pots to obtain the specified meter readings.

The inputs are 1kHz unless stated otherwise.

INPUT LEVEL	INPUT SOCKET	LINK'S REQ'D	OUTPUT SOCKET	OUTPUT POT	OUTPUT LEVEL	METER RANGE	METER POT	METER READING
135mV	SK4/6					LINE IN	RV 22	60
"	"	88	SK4/2		135mV	VHF Tx	RV 21	60
"	"	93	SK1/2 & 3*	RV 5	135mV	UHF Tx	RV 16	60
"	"	103	SK2/2 & 3	RV 26	390mV		RV 18	60
"	"	98	SK5/2	RV 25	390mV	LINE OUT	RV 19	60
135mV	SK1/6 131						RV 15	60
390mV	SK3/2 3	14,15				UHF Rx	RV 17	60
"	"	"	SK5/2	RV 10 RV 3	390mV	VHF Tx		60
"	SK6/2					VHF Rx	RV 20	60
"				* RV 6		UHF Tx		60
3.5V DC	SK1/4	4	CHECK R116 = LINK			UHF RF	RV 23	F.S.D.
10V DC	SK4/4	22				VHF RF	RV 24	F.S.D.

* CONNECT A 600Ω RESISTOR ACROSS SK1/2 AND 3 FOR THESE ADJUSTMENTS.



3.4. PC BOARD COMPONENT SCHEDULE

RESISTORS

R1	33k, 5%, CR25, Carb.F.	2322 211 13333
R2	15k, 5%, CR25, Carb.F.	2322 211 13153
R3	68k, 5%, CR25, Carb.F.	2322 211 13683
R4	10k, 5%, CR25, Carb.F.	2322 211 13103
R5	22k, 5%, CR25, Carb.F.	2322 211 13223
R6	56k, 5%, CR25, Carb.F.	2322 211 13563
R7	100k, 5%, CR25, Carb.F.	2322 211 13104
R8	150k, 5%, CR25, Carb.F.	2322 211 13154
R9	150k, 5%, CR25, Carb.F.	2322 211 13154
R10	10k, 5%, CR25, Carb.F.	2322 211 13103
R11	22k, 5%, CR25, Carb.F.	2322 211 13223
R12	68k, 5%, CR25, Carb.F.	2322 211 13683
R13	150k, 5%, CR25, Carb.F.	2322 211 13154
R14	150k, 5%, CR25, Carb.F.	2322 211 13154
R15	100k, 5%, CR25, Carb.F.	2322 211 13104
R16	100k, 5%, CR25, Carb.F.	2322 211 13104
R17	220Ω, 5%, CR25, Carb.F.	2322 211 13221
R18	1k5, 5%, CR25, Carb.F.	2322 211 13152
R19	15k, 5%, CR25, Carb.F.	2322 211 13153
R20	68k, 5%, CR25, Carb.F.	2322 211 13683
R21	22k, 5%, CR25, Carb.F.	2322 211 13223
R22	68k, 5%, CR25, Carb.F.	2322 211 13683
R23	150k, 5%, CR25, Carb.F.	2322 211 13154
R24	150k, 5%, CR25, Carb.F.	2322 211 13154
R25	680Ω, 5%, CR25, Carb.F.	2322 211 13681
R26	3k3, 5%, CR25, Carb.F.	2322 211 13332
R27	1m8, 5%, CR25, Carb.F.	2322 211 12185
R28	33k, 5%, CR25, Carb.F.	2322 211 13333
R29	10k, 5%, CR25, Carb.F.	2322 211 13103
R30	22k, 5%, CR25, Carb.F.	2322 211 13223
R31	56k, 5%, CR25, Carb.F.	2322 211 13563
R32	22k, 5%, CR25, Carb.F.	2322 211 13223
R33	33k, 5%, CR25, Carb.F.	2322 211 13333
R34	10k, 5%, CR25, Carb.F.	2322 211 13103
R35	22k, 5%, CR25, Carb.F.	2322 211 13223
R36	68k, 5%, CR25, Carb.F.	2322 211 13683
R37	100k, 5%, CR25, Carb.F.	2322 211 13104
R38	150k, 5%, CR25, Carb.F.	2322 211 13154
R39	150k, 5%, CR25, Carb.F.	2322 211 13154
R40	10k, 5%, CR25, Carb.F.	2322 211 13103
R41	22k, 5%, CR25, Carb.F.	2322 211 13223
R42	68k, 5%, CR25, Carb.F.	2322 211 13683
R43	150k, 5%, CR25, Carb.F.	2322 211 13154
R44	150k, 5%, CR25, Carb.F.	2322 211 13154
R45	100k, 5%, CR25, Carb.F.	2322 211 13104
R46	100k, 5%, CR25, Carb.F.	2322 211 13104
R47	22k, 5%, CR25, Carb.F.	2322 211 13223
R48	68k, 5%, CR25, Carb.F.	2322 211 13683
R49	150k, 5%, CR25, Carb.F.	2322 211 13154
R50	150k, 5%, CR25, Carb.F.	2322 211 13154
R51	33k, 5%, CR25, Carb.F.	2322 211 13333
R52	1m8, 5%, CR25, Carb.F.	2322 211 12185
R53	220Ω, 5%, CR25, Carb.F.	2322 211 13221
R54	56k, 5%, CR25, Carb.F.	2322 211 13563
R55	10k, 5%, CR25, Carb.F.	2322 211 13103
R56	22k, 5%, CR25, Carb.F.	2322 211 13223
R57	56k, 5%, CR25, Carb.F.	2322 211 13563
R58	22k, 5%, CR25, Carb.F.	2322 211 13223
R59	47k, 5%, CR25, Carb.F.	2322 211 13473
R60	68k, 5%, CR25, Carb.F.	2322 211 13683
R61	150k, 5%, CR25, Carb.F.	2322 211 13154
R62	68k, 5%, CR25, Carb.F.	2322 211 13683
R63	15k, 5%, CR25, Carb.F.	2322 211 13153
R64	47k, 5%, CR25, Carb.F.	2322 211 13473
R65	22k, 5%, CR25, Carb.F.	2322 211 13223
R66	22k, 5%, CR25, Carb.F.	2322 211 13223
R67	18k, 5%, CR25, Carb.F.	2322 211 13183
R68	18k, 5%, CR25, Carb.F.	2322 211 13183
R69	18k, 5%, CR25, Carb.F.	2322 211 13183
R70	18k, 5%, CR25, Carb.F.	2322 211 13183

RESISTORS (Cont.)

R71	47k, 5%, CR25, Carb.F.	2322 211 13473
R72	150k, 5%, CR25, Carb.F.	2322 211 13154
R73	68k, 5%, CR25, Carb.F.	2322 211 13683
R74	18k, 5%, CR25, Carb.F.	2322 211 13183
R75	68k, 5%, CR25, Carb.F.	2322 211 13683
R76	18k, 5%, CR25, Carb.F.	2322 211 13183
R77	18k, 5%, CR25, Carb.F.	2322 211 13183
R78	47k, 5%, CR25, Carb.F.	2322 211 13473
R79	150k, 5%, CR25, Carb.F.	2322 211 13154
R80	68k, 5%, CR25, Carb.F.	2322 211 13683
R81	68k, 5%, CR25, Carb.F.	2322 211 13683
R82	18k, 5%, CR25, Carb.F.	2322 211 13183
R83	33k, 5%, CR25, Carb.F.	2322 211 13333
R84	18k, 5%, CR25, Carb.F.	2322 211 13183
R85	18k, 5%, CR25, Carb.F.	2322 211 13183
R86	18k, 5%, CR25, Carb.F.	2322 211 13183
R87	100k, 5%, CR25, Carb.F.	2322 211 13104
R88	33k, 5%, CR25, Carb.F.	2322 211 13333
R89	680Ω, 5%, CR25, Carb.F.	2322 211 13681
R90	47k, 5%, CR25, Carb.F.	2322 211 13473
R91	680Ω, 5%, CR25, Carb.F.	2322 211 13684
R92	18k, 5%, CR25, Carb.F.	2322 211 13183
R93	18k, 5%, CR25, Carb.F.	2322 211 13183
R94	68k, 5%, CR25, Carb.F.	2322 211 13683
R95	18k, 5%, CR25, Carb.F.	2322 211 13183
R96	220k, 5%, CR25, Carb.F.	2322 211 13224
R97	47k, 5%, CR25, Carb.F.	2322 211 13473
R98	120k, 5%, CR25, Carb.F.	2322 211 13124
R99	680Ω, 5%, CR25, Carb.F.	2322 211 13681
R100	47k, 5%, CR25, Carb.F.	2322 211 13473
R101	150k, 5%, CR25, Carb.F.	2322 211 13154
R102	68k, 5%, CR25, Carb.F.	2322 211 13683
R103	68k, 5%, CR25, Carb.F.	2322 211 13683
R104	680Ω, 5%, CR25, Carb.F.	2322 211 13681
R105	1m2, 5%, CR25, Carb.F.	2322 211 12125
R106	1m0, 5%, CR25, Carb.F.	2322 211 13105
R107	560k, 5%, CR25, Carb.F.	2322 211 13564
R108	22k, 5%, CR25, Carb.F.	2322 211 13223
R109	22k, 5%, CR25, Carb.F.	2322 211 13223
R110	22k, 5%, CR25, Carb.F.	2322 211 13223
R111	22k, 5%, CR25, Carb.F.	2322 211 13223
R112	22k, 5%, CR25, Carb.F.	2322 211 13223
R113	22k, 5%, CR25, Carb.F.	2322 211 13223
R114	22k, 5%, CR25, Carb.F.	2322 211 13223
R115	22k, 5%, CR25, Carb.F.	2322 211 13223
R116	68k, 5%, CR25, Carb.F.	2322 211 13683
R117	68k, 5%, CR25, Carb.F.	2322 211 13683
R118	22k, 5%, CR25, Carb.F.	2322 211 13223
R119	680Ω, 5%, CR25, Carb.F.	2322 211 13681
R120	1k0, 5%, CR25, Carb.F.	2322 211 13102
R121	150k, 5%, CR25, Carb.F.	2322 211 13154
R122	150k, 5%, CR25, Carb.F.	2322 211 13154
R123	18k, 5%, CR25, Carb.F.	2322 211 13183
R124	18k, 5%, CR25, Carb.F.	2322 211 13183
RV1	47k, ±30%, Carb.	2120 357 01473
RV2	47k, ±30%, Carb.	2120 357 01473
RV3	47k, ±30%, Carb.	2120 357 01473
RV4	47k, ±30%, Carb.	2120 357 01473
RV5	47k, ±30%, Carb.	2120 357 01473
RV6	47k, ±30%, Carb.	2120 357 01473
RV7	47k, ±30%, Carb.	2120 357 01473
RV8	47k, ±30%, Carb.	2120 357 01473
RV9	47k, ±30%, Carb.	2120 357 01473
RV10	47k, ±30%, Carb.	2120 357 01473
RV11	47k, ±30%, Carb.	2120 357 01473
RV12	47k, ±30%, Carb.	2120 357 01473
RV13	47k, ±30%, Carb.	2120 357 01473
RV14	47k, ±30%, Carb.	2120 357 01473
RV15	100k, ±20%, Cement	2113 391 00512

PC BOARD COMPONENT SCHEDULE (Continued)

RESISTORS (Cont.)

RV16	100k, ±20%, Cermet	2113 391 00512
RV17	100k, ±20%, Cermet	2113 391 00512
RV18	100k, ±20%, Cermet	2113 391 00512
RV19	100k, ±20%, Cermet	2113 391 00512
RV20	100k, ±20%, Cermet	2113 391 00512
RV21	100k, ±20%, Cermet	2113 391 00512
RV22	100k, ±20%, Cermet	2113 391 00512
RV23	200k, ±10%, Cermet	2113 391 00513
RV24	200k, ±10%, Cermet	2113 391 00513
RV25	47k, ±30%, Carb.	2120 357 01473
RV26	47k, ±30%, Carb.	2120 357 01473

CAPACITORS

C1	1n, Cer. Pl.	2222 630 01102
C2	1n, Cer. Pl.	2222 630 01102
C3	10u, 25V, Tant.	2002 140 16109
C4	1n, Cer. Pl.	2222 630 01102
C5	10u, 25V, Tant.	2002 140 16109
C6	10u, 25V, Tant.	2002 140 16109
C7	1n, Cer. Pl.	2222 630 01102
C8	4u7, 35V, Tant.	2020 004 90001
C9	1n, Cer. Pl.	2222 630 01102
C10	1n, Cer. Pl.	2222 630 01102
C11	1n, Cer. Pl.	2222 630 01102
C12	4u7, 35V, Tant.	2020 004 90001
C13	1n, Cer. Pl.	2222 630 01102
C14	22n, ±10%, Pest.	2020 300 39223
C15	330pf, ±10%	2222 630 01331
C16	68n, Pest.	2020 300 39683
C17	1u, 35V, Tant.	2002 140 12108
C18	68n, Pest.	2020 300 39683
C19	1u, 35V, Tant.	2002 140 12108
C20	330p, ±10%	2222 630 01331
C21	1u, 35V, Tant.	2002 140 12108
C22	100p, ±2% NPO	2222 632 10101
C23	1u, 35V, Tant.	2002 140 12108
C24	68n, Pest.	2020 300 39683
C25	1u, 35V, Tant.	2002 140 12108
C26	220p, ±10%	2222 630 01331
C27	1u, 35V, Tant.	2002 140 12108
C28	1u, 35V, Tant.	2002 140 12108
C29	22n, Pest.	2020 300 39223
C30	330p, ±10%	2222 630 01331
C31	1u, 35V, Tant.	2002 140 12108
C32	68n, Pest.	2020 300 39683
C33	1u, 35V, Tant.	2020 004 90001
C34	4u7, 35V, Tant.	2020 004 90001
C35	1u, 35V, Tant.	2002 140 12108
C36	68n, Pest.	2020 300 39683
C37	4u7, 35V, Tant.	2020 004 90001
C38	4u7, 35V, Tant.	2020 004 90001
C39	470p, ±10%	2222 630 01471
C40	100p, ±10%	2222 555 56101
C41	1u, 35V, Tant.	2002 140 12108
C42	1u, 35V, Tant.	2002 140 12108
C43	1u, 35V, Tant.	2002 140 12108
C44	220p, ±10%	2222 630 01221
C45	68n, Pest.	2020 300 39683
C46	4u7, 35V, Tant.	2020 004 90001
C47	4u7, 35V, Tant.	2020 004 90001
C48	1u, 35V, Tant.	2002 140 12108
C49	68n, Pest.	2020 300 39683
C50	330p, ±10%	2222 630 01331
C51	22n, Pest.	2020 300 39223
C52	4u7, 25V, Tant.	2020 004 90001
C53	100n, Pest.	2020 300 39104
C54	100n, Pest.	2020 300 39104
C55	100n, Pest.	2020 300 39104
C56	100n, Pest.	2020 300 39104
C57	100n, Pest.	2020 300 39104
C58	47p, ±10%	2222 638 10479

CAPACITORS (Cont.)

C59	100n, Pest.	2020 300 39104
C60	4u7, 35V, Tant.	2020 004 90001
C61	100pf ± 10%	2222 555 56101
C62	100pf ± 10%	2222 555 56101
C63	100pf ± 10%	2222 555 56101
C64	100pf ± 10%	2222 555 56101

SEMICONDUCTORS

TR1	Transistor, BC558	9331 977 30112
TR2	Transistor, BC548	9331 976 40112
TR3	Transistor, BC558	9331 977 30112
TR4	Transistor, BC548	9331 976 40112
TR5	Transistor, LM317T	9334 372 20112
TR6	Transistor, BC548	9331 976 40112
TR7	Transistor, BC558	9331 977 30112
TR8	Transistor, BC548	9331 976 40112
TR9	Transistor, BC558	9331 977 30112
TR10	Transistor, BC548	9331 976 40112
TR11	Transistor, BC558	9331 977 30112
TR12	Transistor, BC548	9331 976 40112
TR13	Transistor, BC548	9331 976 40112
TR14	Transistor, BC558	9331 977 30112
TR15	Transistor, BC548	9331 976 40112
D1	Diode, BAV20	9331 892 00112
D2	Diode, BAV20	9331 892 00112
D3	Diode, BAV20	9331 892 00112
D4	Diode, BAV20	9331 892 00112
D5	Diode, BAV20	9331 892 00112
D6	Diode, BZX79L10	9331 177 90112
D7	Diode, BAV20	9331 892 00112
D8	Diode, BAV20	9331 892 00112
D9	Diode, BAV20	9331 892 00112
D10	Diode, BAV20	9331 892 00112
D11	Diode, BAV20	9331 892 00112
D12	Diode, BAV20	9331 892 00112
D13	Diode, BAV20	9331 892 00112
D14	Diode, BAV20	9331 892 00112
D15	Diode, BAV20	9331 892 00112
D16	Diode, BAV20	9331 892 00112
D17	Diode, BAV20	9331 892 00112
D18	Diode, BAV20	9331 892 00112
D19	Diode, BAV20	9331 892 00112
D20	Diode, BAV20	9331 892 00112
D21	Diode, BAV20	9331 892 00112
D22	Diode, BAV20	9331 892 00112
D23	Diode, BAV20	9331 892 00112
D24	Diode, BAV20	9331 892 00112
D25	Diode, OA95	9330 000 90112
D26	Diode, OA95	9330 000 90112
D27	Diode, OA95	9330 000 90112
D28	Diode, OA95	9330 000 90112
IC1	I.C. HEF4081P	9332 826 80112
IC2	I.C. HEF4081P	9332 826 80112
IC3	I.C. HEF4081P	9332 826 80112
IC4	I.C. LM3900	9332 633 30112
IC5	I.C. LM3900	9332 633 30112
SK1	Socket	2422 026 01435
SK2	Socket	2422 026 01435
SK3	Socket	2422 026 01435
SK4	Socket	2422 026 01435
SK5	Socket	2422 026 01435
SK6	Socket	2422 026 01435
SK7	Socket	2422 026 01435
SK8	Socket	2422 026 01435
	14 Pin Socket	2422 549 13156

3.5. LIU3 FRONT PANEL COMPONENTS

M1	METER KM48 100uA	2422 181 62065
SW1	SWITCH ROTARY OAK 25/IP/11 POS.	NOT CODED
Pin 129	SOCKET BANANA, RED GR261	2402 024 00017
Pin 130	SOCKET BANANA, BLACK GR261	2402 024 00019

SECTION 4. CIRCUIT DIAGRAM